

MARKETING OF FACTORY SHOP TOURISM IN
GREATER CAPE TOWN USING ArcIMS

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University of Stellenbosch.



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DECLARATION

I, the undersigned, hereby declare that the work contained in this thesis is my own original work and that I have not previously in its entirety or in part submitted it at any university for a degree.

Signature:

Date:

ABSTRACT

Tourism has, in recent years, become a vital source of foreign currency for South Africa; in addition it provides many South Africans with employment. The process of planning a trip involves locating places of interest to visit. In this age of technological advances, the Internet is one of the most popular methods of sourcing information. This study aims to act as a guideline for the creation of interactive maps for tourism websites using factory shopping as a case study. The locations of all the factory shops in the Cape Metropolitan Area were captured and served over the Internet using ArcIMS. The report begins with a discussion of the geographical aspects of tourism and of the way that geographical information systems (GIS) can be applied to tourism. Global factory shopping trends and the tourism and travel market are briefly investigated.

The second chapter continues the discussion of factory shops and tourism, but focuses on Cape Town. The types of shops found in Cape Town are discussed as well as their marketing methods. The possibility of factory shop tourism in Cape Town is examined and compared to factory shop tourism overseas.

Chapter Three details the way that the locations of the factory shops were captured. The reasons for the demarcation of the study area are discussed. The database design and factory shop capture methods are explained. The attributes added to the factory shops are qualified and the categories of factory shops explained.

Chapter Four introduces Internet mapping and ArcIMS. The website target audience is investigated and the ArcIMS architecture explained. A discussion of the set-up of the website is presented in a step-by-step format, allowing readers to create their own website.

Chapters Five and Six detail the final site composition and testing of this site as well as possible website additions and customisations in this research respectively. The feasibility of this website in South Africa is discussed and the need for a fast Internet connection is regarded as a reason for the application's possible limited success.

Keywords: GIS, internet mapping, ArcIMS, tourism, travel, factory shops, internet marketing, retail marketing, South African tourism, tourists

OPSOMMING

Toerisme het in die in afgelope jare 'n belangrike bron van buitelandse valuta vir Suid-Afrika geword. Dit skep ook werksgeleenthede vir baie Suid-Afrikaners. Die proses om te kies waar om met vakansie te gaan, is van kardinale belang en in ons eeu van tegnologie is die Internet een van die mees populêre maniere om die inligting op te spoor. Die doel van hierdie studie is om riglyne daar te stel vir die skep van 'n interaktiewe kaart vir toerisme webwerwe, deur gebruik te maak van fabriekswinkels as 'n gevallestudie. Die ligging van die winkels in die Kaapse Metropolitaanse Streek is vasgelê en bedien op die Internet deur middel van ArcIMS.

Die verslag begin met 'n bespreking van die geografiese aspekte van toerisme en die manier hoe geografiese inligtingstelsels (GIS) toegepas kan word vir toerisme. Fabriekswinkel koop-tendense, die toerisme- en reisbedryf word kortliks ondersoek. Die bespreking van fabriekswinkels en toerisme word in die tweede hoofstuk voortgesit, maar met 'n Weskaap-fokus. Die verskillende soorte fabriekswinkels wat in Kaapstad gevind word, asook hul bemerkingsmetodes word bespreek. Die moontlikheid van fabriekswinkeltoerisme in Kaapstad word ondersoek en vergelyk met soortgelyke toerisme oorsee.

Hoofstuk Drie beskryf die wyses waarop die ligging van die fabriekswinkels vasgelê is. Die redes vir die afbakening van die studiegebied asook die databasisontwerp en fabriekswinkel vaslê-metodes word verduidelik. Die kenmerke wat aan die fabriekswinkels toegeken is, word gekwalifiseer, gekategoriseer en verduidelik. Hoofstuk Vier stel Internetkartering en ArcIMS bekend. Die webwerf teikengroep asook die ArcIMS argitektuur word ondersoek en verduidelik. Die opstel van die webwerf word stapsgewys uiteengesit sodat lesers hul eie webtuistes kan opstel.

Hoofstuke Vyf en Ses beskryf die resulterende webtuiste en die toetsing daarvan, asook die moontlike webwerf verbeterings wat gemaak kan word. Die uitvoerbaarheid van hierdie webtuiste in Suid-Afrika word bespreek en die behoefte aan 'n hoëspoed Internet-konneksie word gesien as 'n moontlike beperking vir die sukses daarvan.

Sleutelwoorde: GIS, Internet-kartering, ArcIMS, toerisme, reis, fabriekswinkels, Internet-bemarking, kleinhandelbemarking, Suid-Afrikaanse toerisme en toeriste

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CHAPTER 1: FACTORY SHOPS AND TOURISM - A GEOGRAPHICAL PERSPECTIVE

It is widely acknowledged that travel and tourism are the world's largest industry and generators of jobs (Smith, 1997). In South Africa this is no different. With the South African rand having depreciated in value against foreign currencies it is now far more affordable for overseas travellers to visit South Africa. The World Tourism Organisation (2002) (WTO) has calculated that tourists to South Africa increased from 2 million in 1995 to 8.2 million in 2001. These tourists have become an important source of foreign currency in South Africa and are expected to contribute R10 billion to the Cape Town economy during the 2002/2003 holiday season (Smit 2002).

Veal (1997) lists many areas in tourism and leisure research where geographers have already distinguished themselves and he includes spatial modelling of levels of tourism and observation research creating 'lifestyle maps' to depict leisure behaviour. What he fails to touch on is the effect of geography on the marketing of leisure activities and travel. Goeldner, Ritchie & McIntosh (2000) contend that the geographer's approach to tourism sheds light on the location of tourist areas. However there are many more aspects of tourism that could benefit from geographical research; Ioannides & Debbage (1997) state that there is a strong need to broaden the scope of geographical research on tourism.

Maps are a key component of travel and tourism. Residents and tourists alike use maps to locate a place of interest and to plan their travels to selected destinations. However tourism maps are often designed to show the route to a single place of interest. By creating an interactive tourism map the tourist is able to select many different places of interest and plan trips between them. This will allow the tourists to create their own maps to suit their own travel needs.

In this study factory shops were chosen as the locations of interest that would be presented to tourists. This choice has the added advantage of being something that not only interests tourists, but local residents as well. Factory shops, or for that matter any retail outlet, are reliant on the correct choice of location to maximise the number of clients they service. With the location of a shop playing a big roll in its success, it is clear that this topic would interest geographers; Jones

(1995), Jansonius (1999), Lawson *et al.* (2000), Robertson (1997) and Wheeler & Wheeler (1992) have all studied consumer behaviour and the spatial arrangement of factory shops in urban areas.

1.1 RESEARCH PROBLEM

The question arises: how can South Africans entice tourists and locals alike to visit an area of interest. The method of marketing the location of these areas should have the following characteristics:

- ❑ The marketing and locational information should be easy to distribute internationally;
- ❑ The marketing and locational information should be available to local residents;
- ❑ The locational information should be in a format that is easy to understand and use;
- ❑ The locational information should allow the user to select and locate places of interest.

Geographical information systems (GIS) have provided a way to market the location of places of interest by using the Internet to display them on an interactive map. These maps allow the user to locate, query and select any number of places of interest. The technology that creates these interactive maps is easy to use and requires only that the user have Internet connectivity. In the past this would have meant that very few users had access to the interactive map, but more recently the number of people with Internet access has increased by leaps and bounds. Roldan (2001) found that by 2001, 64 per cent of the United States of America (USA) population had Internet access. As time goes on this number is expected to increase and potential tourists will use the Internet more and more when planning trips.

Theobald & Dunsmore (2000) comment on the evolutionary and revolutionary changes that the Internet has undergone, which has led to large numbers of tourism related websites appearing, of which 36 favourite websites are listed. However there are many more websites that a potential tourist can use, including Expedia and Map Quest (see Appendix A for more information). At these websites one can plan a route from one place to another and even choose shops to visit en route. This type of technology is not used extensively in South Africa and the official tourism site for Cape Town (www.gocapetown.co.za) lacks maps of any type. This research will determine

whether it is possible to create an Internet mapping service in order to promote tourism in South Africa. The service will be distributed over the Internet and e-mail will be used to invite various local and international visitors to the website. The visitors will be asked to remark on the website speed, user-friendliness and usefulness.

Many of the locations of historical, cultural and environmental places of interest in South Africa are already well marketed. When it comes to retail outlets, only shops selling South African curios are well marketed overseas. Lawson *et al.* (2000) have found that in New Zealand tourists engage in leisure shopping when travelling. In South Africa tourists are unlikely to show any special interest in the average retail outlet, since they seldom contain items that are different from what tourists can get at home. Factory shops do offer a range of items to interest tourists. Tourists who bring relatively little luggage with them are often interested in cheaply priced clothing. Tourists in USA tend to be especially interested in factory shops. Goeldner, Ritchie & McIntosh (2000) have determined that 46 per cent of men and 55 per cent of woman tourists visit factory shops in the USA. Black (pers. comm.) states that factory shopping and factory shop tourism in South Africa is also a thriving pastime, factory shop tours were even available at one time. Black (pers. comm.) further notes that factory shopping is not limited to the poorer communities, but the outlets are widely patronised by both tourists and the local residents of wealthier communities.

Since tourists and local residents already visit factory shops around the world and are likely to have Internet access, it is safe to conclude that by placing the locations of Cape Town's factory shops on the Internet, the website would generate interest from tourists and locals alike. This will enable the researcher to gather comments about the website design and user-friendliness from visitors to the website originating from various countries.

1.2 FACTORY SHOPS AND SHOPPING

There are various types of factory shops that a tourist might visit. The shops most likely to interest tourists are those grouped into factory shop malls or factory outlet centres since it is easier to walk between shops. Hignell (1996: 14) defines *factory outlet centres* as "groups of manufacturers or retailers who trade from separate shop units or outlet stores, on a single site". Wheeler & Wheeler

(1992: 259) define a *factory outlet mall* as "a concentration of stores each selling goods produced by a single manufacturer". However, many factory shops or clearance outlets are not grouped with

other shops, but are located next to the factory that manufactures the merchandise or located in a building in an industrial area. Hignell (1996: 14) defines these types of *factory clearance outlets* or factory shops as “units selling china, glass or clothing, which started life selling products cheaply to staff”.

If one were to derive a definition for factory shops for South Africa, one might choose to combine the above definitions and define a *factory shop* as a retail outlet that trades in excess factory stock or seconds direct to the public. The concept of seconds refers to those items that fail the manufacturer’s quality-control testing process and can only be sold at a discounted price. To most shoppers the simple definition of a *factory shop* is a place where one can buy articles that are slightly less than perfect for prices that are lower than those at normal retail outlets. Hoban (1998) observes that consumers’ love of a good bargain has provided the impetus for the development of factory shops. These consumers are not only limited to the Cape Town populace; tourists also show an interest in visiting factory shops. Shultz (1994a) notes that the Beltz factory shop in Las Vegas does at least 65 per cent of its annual business with tourists. In the United Kingdom (UK) factory shop tourism is already taking place (De Bres 1991). In addition this phenomenon has been observed in Cape Town with many tourists requesting factory shop locations (Hendricks pers. comm.) and visiting factory shops (Black pers. comm.).

It is not surprising that the number of factory shops has grown in the last few years (Therrien & Dankin 1986). The phenomenon is particularly marked in the USA where Hazel (1995) and Hoban (1998) have commented on the rapid growth of factory shop malls. Factory shops have also begun recording large sales figures (*Chain Store Age* 1998). Shultz (1994b) notes that factory shops in the USA accounted for approximately 20 per cent of the country’s apparel sales in the early 1990s and Rudnitsky’s (1994) projection was that USA factory shops would sell approximately \$20 billion worth of merchandise in 2000. Europe has also experienced good sales of factory shop goods (Ferne & Fernie 1997). Banks (1999) mentions that when USA companies such as Nike and Calvin Klein opened a string of five factory malls in Europe encompassing 120 shops, they recorded sales of over \$500 million in a year.

Some factory shops have moved out of the city and into factory shopping malls (Ferne 1995). Vinocur (1994) states that factory shop malls have become so lucrative that the mall developers have begun to list their companies on the stock exchange. In some cases factory shop chains have

become retail chains, for example Mr Price stores. The Mr Price stores were listed in Black (1994) as factory shops and have only recently been removed from the list of factory shops in Cape Town. Undoubtedly tourists have contributed to the success of factory shops in Cape Town by adding to the number of customers visiting these shops.

1.3 THE TOURISM AND TRAVEL MARKET

It is nigh impossible to count how many tourists visit factory shops, however research shows that tourists in general are becoming more interested in shopping as part of their travel experience (Hudson 2000; Lawson 2000). These tourists could originate from other provinces in South Africa or from overseas. The question is, who are they and what constitutes tourism? Mill & Morrison (1985) state that it is difficult to define tourism and tourists. They state that tourism involves recreation, but recreation is not the sole purpose of tourism. They further remark that tourism occurs during leisure time, yet not all leisure time is used for tourism. Smith (1997) defines tourism in terms of the businesses that directly provide goods and services to those people who engage in business, pleasure or leisure activities away from home. Hudson (2000) uses similar terms to describe tourism stating that it is an activity in which people spend time away from home. In addition, Hudson (2000) comments that a tourist is a consumer of tourism products. Roberts (1991) states that tourism is any activity concerned with the temporary short-term movement of people to destinations outside the places where they normally live and work and their activities during their stay at those destinations. It remains unclear if a factory shop tourist is a visitor originating from overseas, or from outside Cape Town. Could residents of Cape Town travelling from other suburbs not also be considered tourists? Should the answer be yes; there would be few factory shoppers who could claim not being tourists. For the purpose of this study, the researcher will assume that a factory shop tourist is one originating from outside of the Cape Metropolitan Area (CMA).

Irrespective of their origin, the numbers of tourists seem to have increased over the past few years (Smit 2002). Pender (1999) remarks on this growth and explains that the reasons for the increasing number of tourists worldwide are:

- People now have more leisure time than in the past;
- There is now paid holiday leave;

- Holiday packages have made travel affordable; and
- The increase in world trade and globalisation has led to the need for more business trips.

The number of tourists to Africa has increased over the last few years. The World Tourism Organisation (1996) cites the average annual percentage change in tourist arrivals in Africa as 7.4 per cent between the years of 1985 and 1994. The United States of America's (2000; 2001; 2002) Department of Commerce notes that the number of USA tourists visiting Africa increased by 30 000 from 2000 to 2001. It is clear that the number of tourists to South Africa is growing. The World Tourism Organisation (2002) observes that international tourist arrivals to southern Africa have increased from 2 million in 1990 to 8.2 million in 2001 and that the annual average growth in tourism for the sub-region, that contains South Africa, is 3.8 per cent. Cape Town expects to see an increase of up to 10 per cent of international tourists in the 2002/2003 holiday season (Smit 2002).

Inkpen (1998) notes that all governments have an interest in promoting inbound tourism. The South African government is no different. The Minister of Environmental Affairs and Tourism states that South Africa is aggressively marketing itself as a world-class destination for business and tourism (Moosa 2001). According to him the tourism industry contributed R20 billion to the GDP in 2000 and he expected South Africa to rise rapidly from being ranked 21st in the world tourism market to 10th place (Moosa 2001). To help attain this goal Moosa (2001) recently announced an increase in the number of flights to and from South Africa. In 2002 the number of tourists visiting South Africa has once again increased. More recently Moosa (2002a) cites increases in the number of tourists from the UK, Germany, China, Thailand, Japan, India and Lesotho. Domestic tourism also rose between April 2000 and May 2001 and contributed R9.7 billion to the economy. The above figures show that South Africa is experiencing growth in the tourism industry, and that both international and domestic tourists contribute a large amount of money to the South African economy. These same tourists could contribute to large increases in factory shop sales if the factory shop locations were more widely marketed.

The South African government continues to use its resources to market South Africa's tourist attractions to prospective tourists in other countries (Moosa 2000; 2002b). In the UK South Africa is marketed in airports using 60-second advertisements (Hendricks pers. comm.). It is

further marketed by various tourism websites (see Appendix A) including the South African Tourism (SAT) website which provides basic tourist information to prospective visitors. Kotler (1994) states that marketing is driven by the need to satisfy the customer as well as satisfying organisational objectives. To increase the value of these marketing campaigns one should personalise the experience for travellers (Roldan 2001) by allowing them to create their own travel maps.

1.4 USING GIS AND THE INTERNET TO MARKET TOURISM

Inkpen (1998) calls travel and tourism an information business. Tourists rely on accurate information about their surroundings in order to plan their excursions. There are many places where tourists to a city can obtain tourism information, including tourist bureaux, hotels and tourist attractions. However, tourists who are still planning their trip and are not yet in the city of their choice find it hard to locate information about the city. Tourists who are planning a trip rely on the information they can obtain from travel agents in their area. However there is also now a vast amount of information available on the Internet.

Inkpen (1998) states that the Internet has become a marketer's dream because it enables companies of different sizes to compete on more equal terms. He further notes that the Internet allows a company to open up a direct channel of communication with its customers. This means that South African tourism companies can compete on the same level as larger international tourism concerns.

There are many and various tourism websites for South Africa. The South African government has developed a website (www.sawelcome.com) with detailed information about the country, but it contains no maps. Other South African websites are similar and contain a large amount of tourist information, but very few maps. Of the maps that are available most are static maps that only show the routes to a limited number of places, as illustrated in Figure 1.1. Planning to visit Simon's Town and Stellenbosch in the same day, for example, would be a waste of time. It would make more sense to combine visits to places that are closer together. However to do this one would need a map where one could select places of interest and plot a route between them.



Source: www.cape-town.net/html/mapcity.html

Figure 1.1: Static map of Cape Town

These maps show the tourist only a limited number of possible destinations and do not allow for a customized travel route to be developed. If an interactive map is placed on the Internet, tourists would be able to search for the places they are interested in, measure distances and plan travel routes between different places. These maps would market places of interest to tourists and allow the tourist to create maps that are specific to their travel plan.

1.5 RESEARCH GOALS

This study is being completed at a time when tourism in South Africa is becoming an important source of income for the country and the Internet has only begun to grow into a marketing tool. The study discusses how Internet technology can be used to market tourism and travel in South

Africa to both local and international tourists using interactive maps. As such the research has two main areas of interest, namely the location of factory shops and Internet mapping. Three goals relate directly to these two areas of interest.

The first goal is to *capture the locations of the factory shops in the study area using a GIS*. The locations of the shops will need to be aligned with existing cadastral data obtained from the Cape Metropolitan Council (CMC). The data will also require attributes that will enable the user to search for a factory shop, such as the name of a shop, its address and the variety of goods it sells.

The second goal is to *create a website to display the factory shop locations*. The website must use an interactive map which allows one to search for a shop and then display a map with the roads and road names as well as the shop's location and some of its attributes. This website must be easy to create in a short time and require little knowledge about the programme used. So that those with little GIS know-how can easily integrate this technology into their website. The website must work fast and be easy to use.

The third goal is to get an *indication of the way that the website is perceived by both local and overseas users*. Possible improvements to the website will be discussed and possible solutions proposed to problems experienced by the users of the site will be suggested. The speed of the website is crucial, since this will determine whether users wait for the map to download or rather try to find information elsewhere. The study aims to provide readers with the tools and information to create their own interactive maps to market tourism resources. To achieve this the study will create a set of steps to follow when creating an interactive map. There are three sets of steps – one set for each goal which enables users to follow the steps to achieve the goal that they are interested in.

1.6 RESEARCH PROCEDURE

The research procedure broadly follows the three goals of this thesis, namely locating factory shops, setting up an ArcIMS website, and receiving feedback about the website. Figure 1.2 is a graphical representation of the research process.

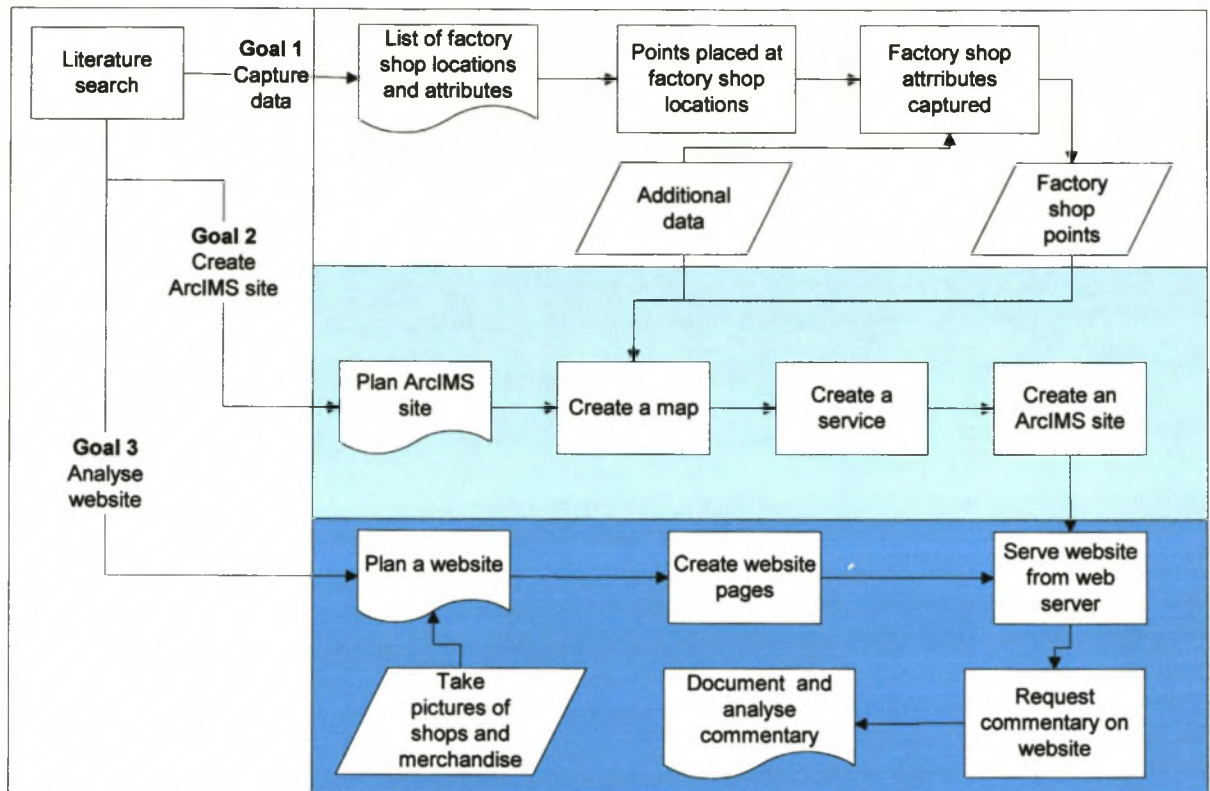


Figure 1.2: The research process to create a factory shop website

The first priority of the study was to identify and locate the factory shops to be mapped. The shops were found using various information sources including Black (2001), local newspapers such as *The Tatler* and *The Tygerberger*, *The factory shopper* (Black 1998 & 1999) and advertising materials collected during visits to factory shops, factory shop malls and the Factory Shop Show, see Appendix C.

The data was originally captured using a geodatabase designed in Microsoft Visio. The location of each shop was captured and (where possible) matched to the CMC address layer that contains all the street addresses for the CMA. The attributes for each factory shop were recorded and the shop was categorised according to the merchandise it sold. Once the data capture was completed, the geodatabase feature class was converted to shape file format, since the ArcIMS version to be used did not support the geodatabase file format.

Following the data capture, the website design began. ArcIMS was first researched as a tool for creating maps on the Internet and the methods for setting up the site were documented. The map service was created and the map design completed. The opening web page was designed and links were created to the map service. Once the website was operational, various users, both locally and internationally, were asked to open and view the site and to e-mail their comments to the researcher or complete the feedback form.

As it is too large a task to capture all the factory shops in South Africa it was decided to limit the study to a smaller area. The prospective area would need to contain a large number of factory shops in addition to a pre-existing and accurate set of base data, such as road centrelines and suburb boundaries. These criteria resulted in the choice of the CMA as the study area.

CHAPTER 2: CAPE TOWN FACTORY SHOP TOURISM

The Western Cape is well known for its clothing manufacturing industry (Black pers.comm.) and Cape Town has a strong clothing industry (City of Cape Town 2001) so it is not surprising that 58% of the factory shops captured for the study are clothing factory shops.

The clothing industry often produces reject garments: some rejects have minor defects and can be sold, although not in the same shop as those garments without flaws. In an effort to rid themselves of reject garments many factories have turned an office or outside building into a small shop selling such garments. An example of this type of shop is the Rex Trueform factory shop in Salt River. Avins (1994) noted that many designers prefer to open their own factory shops rather than sell seconds to other factory shops. When a specific clothing brand becomes more popular or the shop becomes well known, it might have the need to increase the size of its shop or even to move off the factory premises to a more convenient and possibly larger site. Cases in point can be found at Access Park in Kenilworth. Black (pers. comm.) notes that 17 years ago factory shops could be found only in small rooms attached to the factory manufacturing the merchandise.

Throughout South Africa this same philosophy has been applied to many different industries manufacturing goods. There is now such a proliferation of factory shops that books describing them and their wares are published for major South African cities, for example Cape Town's factory shops by Black (2001), Pretoria's factory shops catalogued by Du Preez (1996) and Natal factory shops discussed by O'Connor & Stevenson (1990) and Petersen (1990). Even smaller towns have factory shops, for example the Colibri factory shop on the outskirts of Wellington in the Boland.

Factory shops in Cape Town sell merchandise ranging from plastic products to pot plants, dog food, clothing and pottery. To make the data displayed on the interactive map easy to search, the shops must be grouped into categories. These categories are based on the information the factory shopper is most likely to use, namely the type of merchandise on offer.

This chapter will explore the different types of factory shops and how they can be categorized and captured into a database. It will further investigate the spatial arrangement of the factory shops and

the additional information that can be derived from the shop locations and be added to the database. The chapter will also build upon the general information given on factory shopping trends around the world by exploring factory shopping in South Africa and more specifically in the CMA.

2.1 TYPES OF FACTORY SHOPS

For every type of merchandise produced, there is the possibility of selling seconds of that item in a factory shop. For the purposes of this study it was necessary to group the factory shops in order to make searching for them on an interactive map easier. The types of shops were classified into four primary categories and up to eleven secondary classes in a primary category. The primary groups are:

- ❑ Clothing – clothing for the family, including shoes and material and haberdashery;
- ❑ Food – various types of food, including spices;
- ❑ Homeware – items for use in the home, including glassware, furniture and carpeting; and
- ❑ Miscellaneous – shops which sell items that are too varied or unique to be included in one of the other categories.

More than half the factory shops fall into the clothing class, while almost a quarter are food related. Figure 2.1 shows the proportional distribution of Cape Town's factory shops according to the primary groups used in this study.

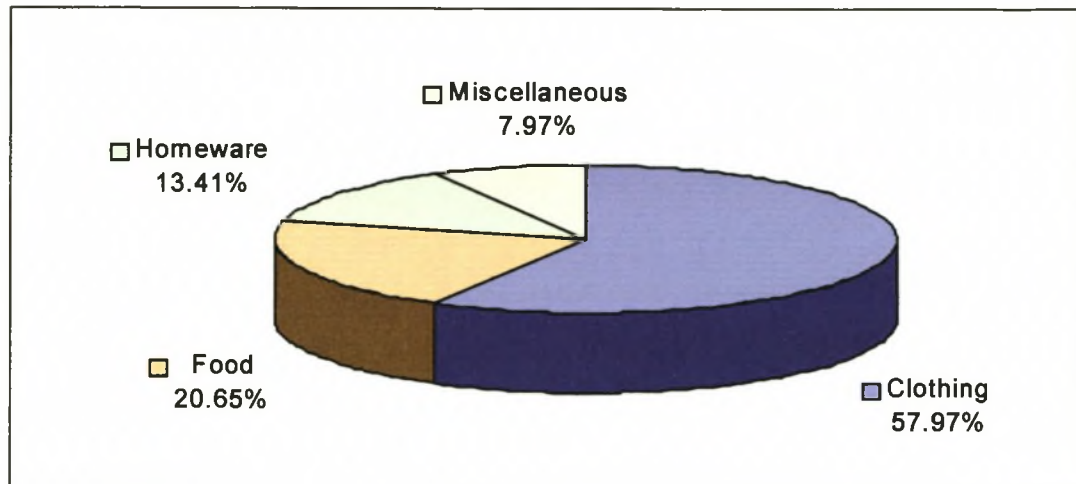


Figure 2.1: Proportional distribution of factory shops according to primary category, Cape Town, 2001

The secondary classes allow for more accurate searches. For example, instead of selecting all the clothing shops, one might choose to select all the ladies' clothing factory shops. Tourists could search a website for factory shops based on their primary and secondary classification. Results of searches can be displayed on interactive maps enabling tourists to plan routes to the shops of their choice.

The secondary groups were chosen bearing in mind what the tourist might be interested in searching for. For example, rather than creating a single secondary class for children's wear, the category was split into two; baby wear and children's wear. This will enable tourists to search for baby clothing or children's clothing and not end up visiting shops containing clothing that they do not want. Having grouped the different types of factory shops, one can observe which types of shops are dominant within the CMA. Table 2.1 details the primary and secondary categories of Cape Town's factory shops. Apart from factory shops selling various types of clothing, shops selling ladies' clothing seem to dominate the clothing category, with shops selling desserts dominating the food category.

Table 1.1: Primary and secondary types and totals of factory shops in Cape Town, 2001

Primary Types	Secondary Types	Number	Percentage
Clothing	Baby wear	7	2.5 %
Clothing	Children's wear	7	2.5 %
Clothing	Clothing accessories	7	2.5 %
Clothing	Clothing various	46	16.7 %
Clothing	Footwear	14	5.1 %
Clothing	Knitwear	7	2.5 %
Clothing	Ladies' wear	33	12.0 %
Clothing	Leatherwear	1	0.4 %
Clothing	Material and haberdashery	20	7.2 %
Clothing	Men's wear	6	2.2 %
Clothing	Sportswear	12	4.3 %
Subtotal: Clothing		160	57.97%
Food	Bakery items	9	3.3 %
Food	Dairy products	2	0.7 %
Food	Desserts	15	5.4 %
Food	Juice	3	1.1 %
Food	Poultry	3	1.1 %
Food	Red meat	2	0.7 %
Food	Seafood	3	1.1 %
Food	Snacks	2	0.7 %
Food	Specialized foods	4	1.4 %
Food	Various foods	12	4.3 %
Food	Vegetables and fruits	2	0.7 %
Subtotal: Food		57	20.65%
Homeware	Carpeting	1	0.4 %
Homeware	Cleaning materials	4	1.4 %
Homeware	Furniture	4	1.4 %
Homeware	Homeware accessories and utensils	8	2.9 %
Homeware	Kitchenware	1	0.4 %
Homeware	Linen	16	5.8 %
Homeware	Sanitary ware	1	0.4 %
Homeware	Various homeware items	2	0.7 %
Subtotal: Homeware		37	13.41%
Miscellaneous	Gardening and floristry items	3	1.1 %
Miscellaneous	Plastic products	1	0.4 %
Miscellaneous	Stationery	3	1.1 %
Miscellaneous	Toiletries	7	2.5 %
Miscellaneous	Toys and baby equipment	2	0.7 %
Miscellaneous	Various items	6	2.2 %
Subtotal: Miscellaneous		22	7.97%
GRAND TOTAL		276	100 %

Sources: Black (2001) & *Bargain hunters delight* (2002)

2.2 SPATIAL DISTRIBUTION OF FACTORY SHOPS

There are many factory shops for a tourist to choose from. Even narrowing it down to ladies' clothing factory shops still presents 33 possible shops to visit. Tourists will thus require additional information to enable them to make their choice of which shop to visit, where and when. If the locations of the factory shops have been captured in a GIS they can be overlaid with other data and compared to derive information that might assist the tourist in deciding which shop to visit.

When tourists visit a factory shop for the first time they do not know what to expect. They might be visiting an industrial area or a commercial area, the shop might be on one of the main roads and thus easy to find or it might require navigating a host of small side-streets. Some tourists prefer to visit a cluster of factory shops, thus minimising the need to travel between different shops. In order for the data posted on the Internet to be truly useful for a tourist, it should include data describing the area where the factory shop is located.

The location of factory shops relative to major roads is an important factor in the decision to visit a factory shop. Tourists can be discouraged from visiting outlets that are farther away from major roads, since they perceive the inconvenience of the distance and effort to reach the location to exceed the benefits of visiting it. The distance that the tourist perceives and the true distance often differ. The perceived distance is referred to as cognitive distance. David & Jenkins (2000) define cognitive distance as the impression formed in the mind about the distance between places that are not intervisible. They have also found that cognitive distance estimates are invariably greater than real distances. These cognitive distances could inhibit a tourist from visiting a factory shop. By supplying the straight-line distance between a major road and a factory shop, along with the other factory shop data, a tourist is offered a more accurate picture of the amount of travel involved in getting to a shop.

To add this data to the factory shop layer, the expressways (for example, M5) and arterial roads (for example, Main Road) in Cape Town were selected from the road centrelines data set and exported to a new file to create a set of major roads. These major roads were used to calculate the distance, in a straight line, from a road to a factory shop. The distance and the major road it was measured from were appended to the factory shop data. When analysing the results of this distance measurement it was found that 65 (23%) factory shops are located within 50 metres of the major

roads. A further 46 (40%) shops are located within 100 metres of a major road with the remaining 165 factory shops (37%) falling outside of the 100 metre radius.

Tourists might also be put off from visiting a factory shop because of the type of area in which the shop is situated. The zoning of the erf on which a factory shop is located is likely to determine the look and feel of the shop. Although the zoning is most likely to be either commercial or industrial there are those shops that operate from local authority zoned erven or in some cases residentially zoned erven. Factory shops located on erven zoned for industry are likely to be contained in warehouses, which have been partitioned off to accommodate the shops. Some of these shops do not offer changing rooms, or simply have a communal changing room. There is most often no carpeting on the floors and no attempts have been made to make them attractive to the public. The perception of some South African factory shoppers is that the industrial areas are more crime ridden than the commercial areas. A factory shop located on a commercially zoned erf is likely to form part of an office complex or shopping complex. These shops often have carpeting, changing rooms and have been decorated to attract the public. They tend to exist in areas that are perceived to be safer to visit since they frequently have many shoppers or office workers wandering around.

The zoning information obtained for this study was contained in five separate files which had been administered by the municipalities within the CMA. Unfortunately each of the five files contained different types of zoning information. Before the information could be used in the website a new field was created for each file and the zoning data copied into the new field. Once the attribute tables had been standardised, the files were merged into one and a spatial join was used to join the relevant zoning information to each factory shop.

The zoning was then classified into four classes: industrial, commercial, various and zoning unknown. The unknown category resulted from the zoning files obtained from the CMC in which this term is used to refer to data that has not yet been captured or where the zoning has still to be decided upon. Since it is impossible to list each and every type of zoning for each erf containing a factory shop, a class named Various was created. It contains the many other types of zoning where factory shops occur, including local authority, education, public open space and proposed railway and road purposes. When this information is attached to the point symbol representing a factory shop, it gives tourists a better indication of the nature of the area they consider visiting.

Figure 2.2 shows the distribution of factory shops within the different zoning categories. It is interesting to note that nearly half of the factory shops are located in industrial areas and just over one quarter in commercial areas. This supports the phenomenon (discussed at the beginning of Chapter 2) that factory shops originated as outlets attached to the factory producing the merchandise and thus one would expect the shops to be located in industrial areas.

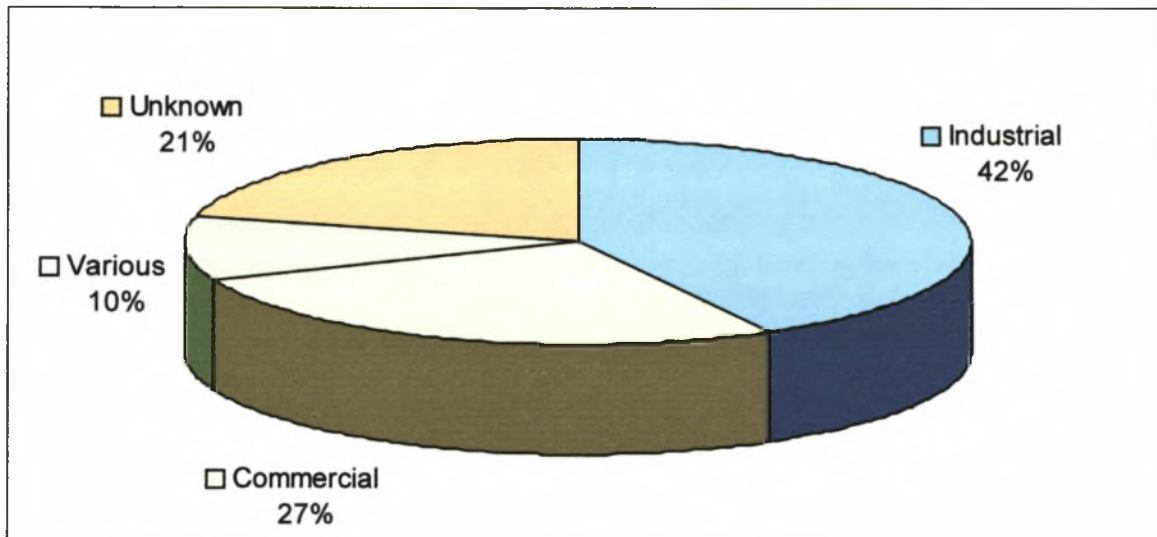


Figure 2.2: Landuse zones in which Cape Town's factory shops are located

A tourist might prefer to visit a location where there are many factory shops within walking distance of one another. After consulting a few regular factory shoppers and Pam Black (pers. comm.), it was agreed that a shopper does not tend to walk to a shop that is situated farther away than 600 metres from the shop currently visited. Although this distance might seem short, it is measured in a direct line and in reality may be longer should a tourist have to walk around a block to get there. A distance matrix script was used to measure the distance from each factory shop to every other factory shop. These distances were recorded in a table. For each factory shop the distances were sorted and the number of shops within 600 metres counted. The number of shops within that distance were then transferred one by one from the distance matrix to the factory shops layer and placed in the clustered field. Figure 2.3 shows the results of this analysis, with the factory shops that have many other shops within 600m being displayed in dark blue and lighter to very light blue showing those that cannot be considered clustered or are the only factory shop in an area.

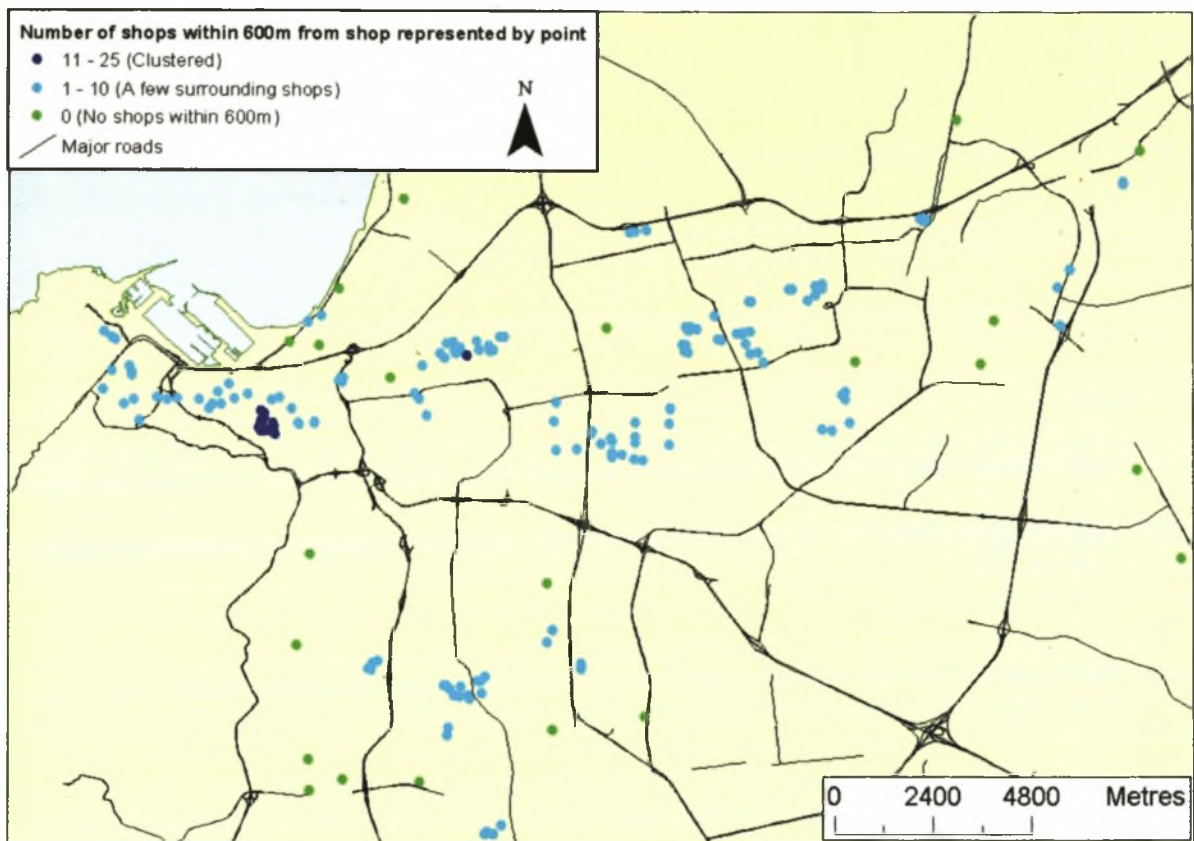


Figure 2.3: Number of shops within walking distance from each Cape Town factory shop

2.3 MARKETING OF FACTORY SHOPS

Factory shops in Cape Town are a well-known “secret”. Many Cape Town residents have no idea that factory shops exist, while others are regular factory shoppers. Once introduced to factory shopping, people tend to return to find more bargains. Stewart-Allen (1997) comments that the success of factory shops in Europe has largely been due to the fact that shoppers are able to find brands at great savings, which they might not find elsewhere in their communities. Black (pers. comm.) has mentioned that factory shops tend not to compete with the larger retailers.

Until recently factory shops have not been at the forefront of retail marketing. They have relied on word of mouth to create a consumer base. Raphel (1995) observes that since factory shops in the USA have begun to compete more with each other and other retail outlets, they have begun using more aggressive marketing tactics. This is also beginning to happen in South Africa; an example is a booklet (*Bargain hunters delight* 2002) handed out at one of the factory outlet malls which details

locations and merchandise sold by other shops. A further marketing strategy has been to create the Factory Shop Show at the Bellville Velodrome, promoted by KFM radio, where approximately 50 factory shops have stalls offering their merchandise at further discounted prices. This show was held twice in 2002, once in July and later in December.

One of the typical examples of increased marketing in factory shops is the case of the Venus Clothing factory shop. Each year before Christmas, Venus Clothing begins to advertise their end-of-year sale in the *Cape Times* and on posters along the busier roads. Although this sale takes place on Day of Goodwill, it still attracts enough people to make the aisles between the clothing rails in this factory warehouse impassable, as shown in Figure 2.4. In comparison, a visit on a weekend in the middle of the year to this factory shop will reveal less than a tenth of the number of people browsing in the aisles, as shown in Figure 2.5.



Figure 2.4: The results of marketing the Venus Clothing factory shop's Day of Goodwill sale



Figure 2.5: Venus Clothing factory shop a week after the Day of Goodwill sale

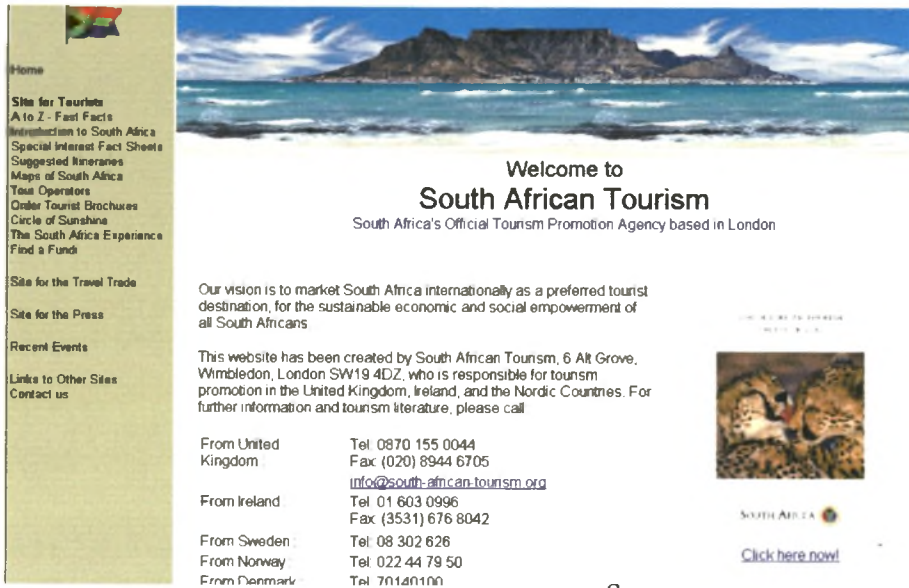
Factory shops are best marketed in the various factory shop books (Black 1994 & 2001; O'Connor & Stevenson 1990) which detail the location and merchandise available in factory shops in the

larger urban areas. Marketing of factory shops has even migrated to the Internet. The author of *The A-Z of factory shops in the Western Cape* (Black 1994 & 2001) has created a website (www.factoryshops.co.za) to help the public keep abreast of which shops have closed and which are newly opened. Missing on this website, however, is a spatially accurate map. It is possible to obtain information about the shop one wants to visit, but it might very difficult to find it.

2.4 MARKETING OF TOURISM IN CAPE TOWN

Tourism is a growing market in South Africa and is encouraged by both government and non-governmental organisations. Markowitz (2001) mentioned in a budget speech that the tourism industry in the Western Cape contributes a considerable amount to provincial employment and attracts approximately 30 per cent of national gross tourism expenditure. In an effort to promote tourism in South Africa, the South African government has made efforts to market South Africa overseas using various methods, including the Internet. Morkel (2001) points out that the Cape Town Unicity's strategy is to position Cape Town both as a world-class competitor and as South Africa's premier tourism and events destination, and also to maximise the economic spin-offs and jobs created (see Appendix C for details on how spending on travel and tourism has increased in the past few years). This strategy seems to be working since Smith (2002) writes that between 5 per cent and 10 per cent more international and domestic visitors will visit Cape Town during the 2002/2003 holiday season. These additional visitors are set to increase tourist spending to R10 billion (Smit 2002).

Inkpen (1998) sees the Internet as one of the most powerful movers and shapers of the travel and tourism industry. It is thus essential that South Africa creates and maintains a strong presence on the Internet. Hendricks (pers. comm.) states that SAT markets South Africa overseas by distributing pamphlets and by running 30- to 60-second adverts at international airports. Two Internet websites, namely www.sawelcome.com and www.satour.co.uk are also maintained by SAT. These sites list many tourism details about South Africa and contain a few historical maps of South Africa dated around the 1800s. Figures 2.6 and 2.7 are examples of pages in these websites.



Source: www.satour.co.uk

Figure 2.6: London-based South African Tourism website opening web page



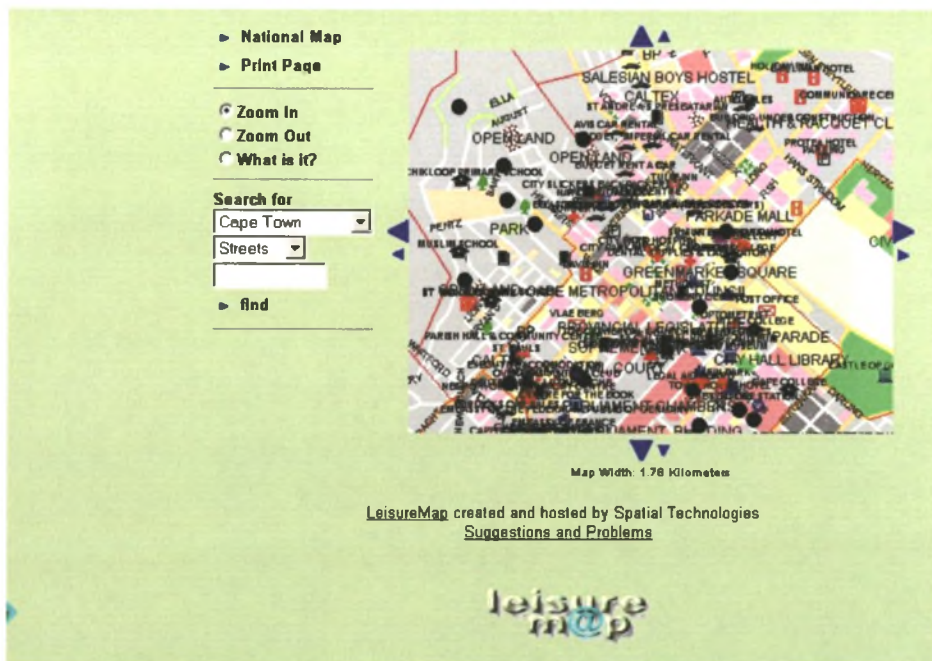
Source: www.sawelcome.com

Figure 2.7: SA Welcome website main web page

Grieco (2000) believes that Internet technology can co-ordinate the market for customised goods at low administrative cost. When marketing South African goods organisations, for example Cape Trading port (www.capetrading.co.za) which exports various South African goods, Munko (www.munko.co.za) exporters of Cape Town-made children's clothing, and National Match

Company (www.nationalmatch.co.za) which exports matches, lighters and shaving goods, use the Internet to gain maximum coverage of overseas markets at relatively little cost. Tourism websites such as Tourism South Africa (www.tourism.org.za), Wellington Tourism South Africa (www.visitwellington.com) and Africa Safaris (www.africa-safari.net) use the Internet to promote tourism activities or tour packages to the overseas market. (Some of the Internet web pages providing tourist information for the Cape Town area are listed in Appendix A).

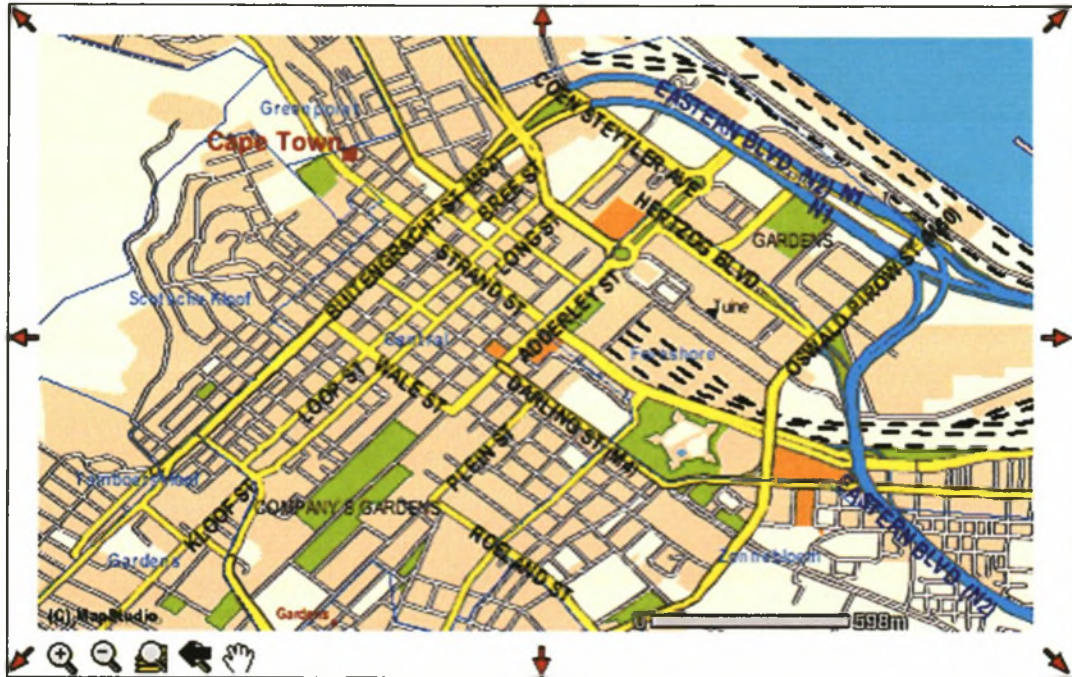
Of the websites listed in Appendix A, only a few contain maps and even fewer contain dynamic maps. Should tourists want to plan their movements around Cape Town, they would, for example, find the LeisureMap website (see Figure 2.8) useful since they could pan around and zoom into the map to view places of interest. Unfortunately the website is slow and at times stops functioning, forcing users to go back to where they started and to have to reload the map. In addition the map featured on the LeisureMap website is cluttered requiring the user to zoom in to a large-scale area to view the data better.



Source: www.leisuremap.co.za/hosts/script/hsrun.exe/webapps/guide/HAHTpage/HS_MapPage

Figure 2.8: Cluttered detail on the interactive map from the LeisureMap website at a small scale

The MapStudio web page on the World Online website (see Figure 2.9) is also useful for tourists wanting to navigate their way around Cape Town. Although this website is slow, it seems to be more stable than the LeisureMap website.



Source: http://www.worldonline.co.za/trav/trav_center/Street.289171.html

Figure 2.9: Cape Town detail in the interactive map from the MapStudio web page on the World Online website

Tourism in Cape Town may be well marketed on the Internet. However, for a tourist planning a factory shopping trip in Cape Town a map book still seems to be a necessity since none of the websites specifically feature factory shops.

2.5 FACTORY SHOP TOURISM

Getz (2000) notes that at one time shopping was a daily routine far removed from leisure, but it has now become a leisure pursuit for many. Many tourists arrive in South Africa with the idea of buying souvenirs to take home. Far from being just a tourism pursuit, shopping has also become a necessity for tourists who arrive with little baggage. Hendricks (pers. comm.) mentioned that many tourists between the ages of 20 and 30 come to South Africa on a low budget and with few possessions in their backpacks.

He further stated that many of the younger tourists were interested in visiting factory shops so that they could buy reasonably priced clothing. Goeldner, Ritchie & McIntosh (2000) observe the same behaviour in the USA, where outlet shopping malls have become a major attraction for tourists. Goeldner, Ritchie & McIntosh (2000) point out that the Travel Industry Association of America (TIA) reported that 37 per cent of all leisure and business travellers visited a discount outlet mall in 1997. This translates into 55 million discount outlet travellers out of a total of 149 million adult travellers annually. Goeldner, Ritchie & McIntosh (2000) further note that 46 per cent of the tourists were men and 54 per cent women. When surveyed, ten per cent of the tourists listed factory shopping as the primary reason for their trip and 79 per cent listed it as the secondary reason. Tourists to South Africa tend to encourage fellow tourists to go factory shopping. Black (pers. comm.) tells of an article written in a German newspaper by a tourist who went factory shopping in Cape Town. The article was so popular that it led to a number of letters being written to Black over the next few months requesting more information on factory shopping in Cape Town. Rudnitsky (1994) notes that in the USA carloads of families and friends travel to do factory shopping and spend approximately \$150 per family. It certainly appears that factory shopping has increased in popularity. Bonniface (2001) suggests that the reason for the popularity of stores that sell merchandise other than tourism items is the fact that they offer the possibility of meeting local residents.

However, the type of people who are interested in factory shopping is not clear. For the interactive map to appeal to factory shoppers the website designer will need to take into consideration who factory shoppers are and design the interactive map and website accordingly. The point representing the factory shop should only contain information that would interest the factory shopper and the database containing this information should be created in a way that will allow the fast display of the data over the Internet. Chapter 3 will profile a typical factory shopper, discuss the location of the study area and detail the design of the factory shop database as well as the information that will be entered into it.

CHAPTER 3: CREATION OF A FACTORY SHOP DATABASE

Hendricks (pers. comm.) and Inkpen (1998) agree that travellers who tend to show an interest in factory shopping are 20 to 35 years old. These potential travellers tend to have high disposable incomes, with foreign tourists having spent an average of R21 516 per tourist during the 2000/2001 tourist season (City of Cape Town 2001). Inkpen (1998) further notes that this profile is the same as the profile for a typical Internet user.

Hudson (2000) categorizes tourists as institutionalised, those that buy tour packages, and non-institutionalised, those who do not depend on the services offered by the tourist establishment. Tourists interested in factory shopping tend to be non-institutionalised as they are self-sufficient with regards to their travel arrangements and not forced into a daily routine as part of a tour group. Institutionalised tourists largely depend on their tour guides for information, whereas non-institutionalised tourists find other means of gathering information. Non-institutionalised tourists prefer to search for the shop they are interested in and determine their own route to it. With this in mind the factory shop database was created to provide a way to search for a specific type of factory shop and to supply a map showing the location of the shop. In addition the database includes telephone numbers and payment methods accepted (for example, credit card or cheque) by each shop. This allows tourists to be more self-sufficient and not have to purchase any special books or maps before they visit a factory shop.

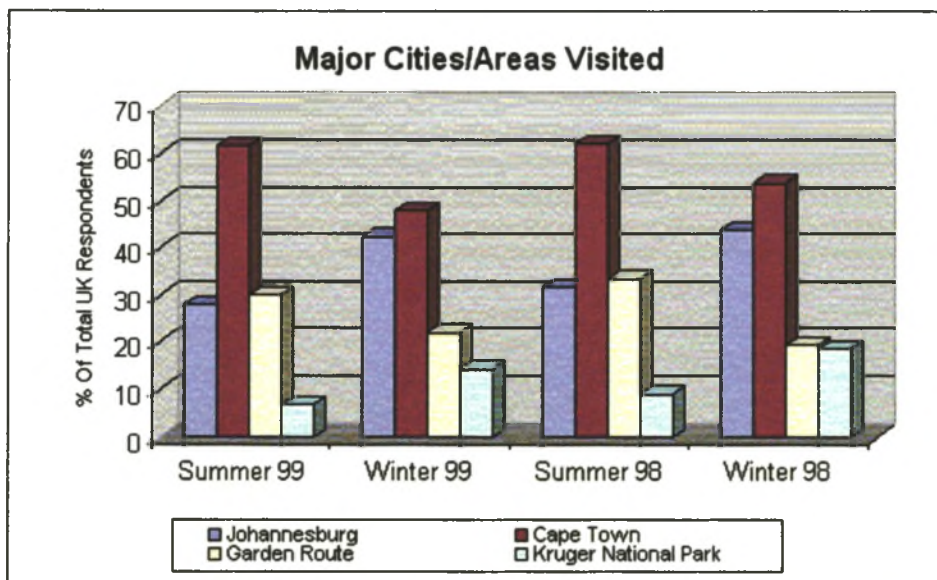
3.1 DEMARCATION OF THE STUDY AREA

The study area encompasses the Cape Metropolitan Area (CMA), as administered by the Cape Metropolitan Council (CMC), recently renamed to the City of Cape Town Administration. This area contains the Cape Town central business district and the major clusters of industrial and manufacturing activities (City of Cape Town 2001). The CMA is the area most likely to contain a large number of factory shops. These shops are easy to locate as a result of their own advertising, in local weekly newspapers (*Tatler* and *Tygerberger*) and daily newspapers (*Cape Times* and *Argus*), and directories about factory shopping in the Western Cape (e.g. Black 2001). Black (pers.

(pers. comm.) has pointed out that Cape Town has the highest concentration of factory shops in South Africa.

The CMC has used GIS to administer the CMA for more than five years and has captured most of the GIS data required for this study. Although GIS is used widely in the City of Cape Town, municipalities lying outside of the CMA have yet to fully employ the power of GIS to manage their services. This study therefore benefits from being located in Cape Town where accurate data on the city has already been captured into GIS format. By using this data as a background it is possible to capture the locations of the factory shops more accurately and in less time.

SAT's statistics (South African Tourism 2002) show that the Western Cape and especially the Cape Town area are the preferred destinations of tourists in South Africa. Figure 3.1 shows the number of tourists visiting Cape Town. A study of Cape Town's factory shops as a tourist attraction therefore seems appropriate.



Source: South African Tourism, www.satour.co.uk (2002)

Figure 3.1: Percentage of tourists from the UK visiting some South African destinations during 1999

3.2 FACTORY SHOP DATABASE DESIGN

When capturing GIS data there are a number of formats and programmes that can be used. Each GIS programme has its advantages and disadvantages, however the ESRI software, which contains advanced methods of capturing data and ways to display that data over the Internet, was chosen for this study. ESRI software supports a variety of file formats and has recently launched a complex database structure called the Geodatabase. This database is stored in Microsoft Access format and can be saved on any computer. The Geodatabase format enables the user to apply certain behaviour rules to the data. As the user captures data and inputs the attributes, the database intelligently narrows down the options for attribute input.

The factory shop database was designed with ease of data capture in mind. By choosing to capture a certain primary type of factory shop the options for secondary type immediately change to match the primary type chosen. For example, once a point representing a clothing factory shop has been captured the list containing the options for secondary type changes to list only clothing shop secondary types, for example ladies' clothing. This enables data capture to be fast and accurate. The behaviour can be designed using Microsoft Visio and applied to an empty Geodatabase. At a later stage, should the database require schema changes, the Visio document is simply revised and reapplied to the Geodatabase without any loss of data. Visio allows the database designer to model behaviour using subtypes (a class of features within a larger group of features) and domains (list of valid attribute values for a feature). Each subtype is linked to the primary type of the factory shop point class that allows the data-capturer to categorize the factory shops as they are captured. A domain is supplied for each subtype and thus alters the choices the data-capturer has when inputting the attributes of the factory shop.

Figure 3.2 is a detailed design diagram that was extracted from the Microsoft Visio document used to model the database. It shows how the subtypes for the PrimaryType field change (for example from "PrimaryTypeDomain=1" for clothing to "PrimaryTypeDomain=2" for food) for each type of shop. The SecondaryType field changes its domain (for example from ClothingDomain to FoodDomain) as the type of shop changes. This presents the data capturer with a list of shop secondary types that match the primary type (for example by choosing a clothing shop one would get the options of ladies' clothing or children's clothing as a secondary type).

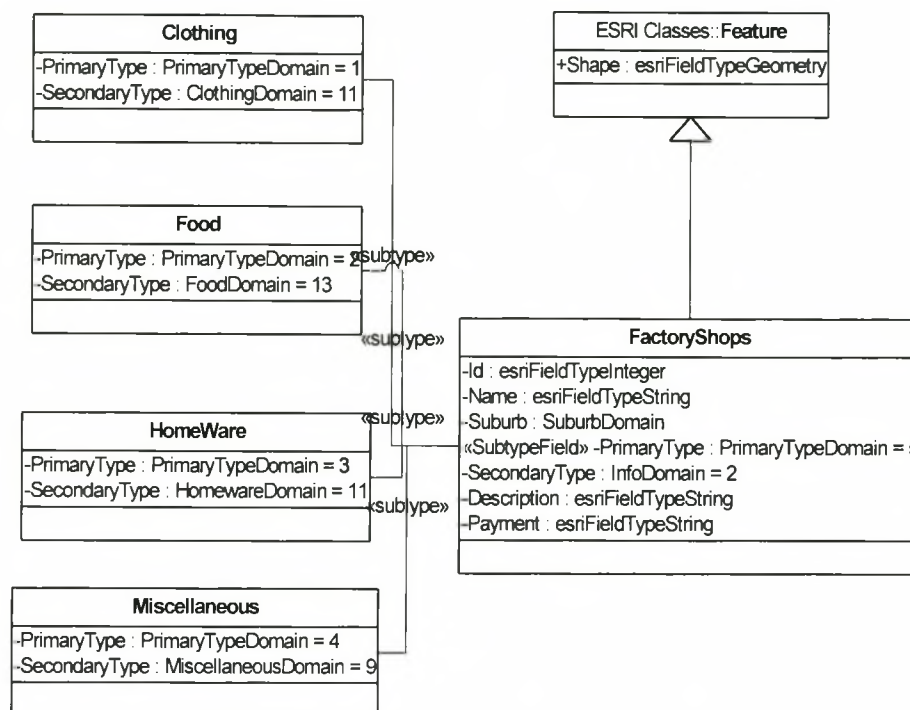


Figure 3.2: Database subtype design and allocation of domains as diagrammed in Microsoft Visio

Another feature of the Geodatabase is the capability to check data captured before they are saved in the database. This further enhances the attribute accuracy of the data by checking that the correct attributes have been assigned to the subtypes, for example an error would exist if one captured a clothing factory shop and set its secondary category to “Specialized food”.

The fields in the database were chosen to allow users to search quickly for the factory shops of their choice. The information captured for each factory shop is:

- ❑ **Id:** A unique identifier used when searching for the data on the Internet.
- ❑ **Name:** The name of the factory shop.
- ❑ **Goods:** A description of the merchandise that is stocked by the shop. It is not possible to list every article, so this description gives only an indication of the merchandise sold.
- ❑ **Payment:** A list of payment methods accepted at the various shops including cash, cheque, credit card or lay-by.

- ❑ **Pry_Type:** This field contains the name of the primary category that has been allocated to the shop.
- ❑ **Sec_Type:** This field contains the secondary category that has been allocated to the shop.
- ❑ **Address:** The street address of the factory shop as listed in the source of the data.
- ❑ **Phone_Num:** The telephone number of the factory shop, including the international dialling code and local dialling code.
- ❑ **Subnme:** The name of the suburb where the shop is located.

Once the database design had been completed the capture of the points representing the factory shops could begin.

3.3 CAPTURE OF FACTORY SHOP INFORMATION

The factory shops' attributes were primarily captured using their street addresses. To enable this type of capturing, background data were required. These data was kindly supplied by the Strategic Information Department of the CMC. The background data included the following layers of information:

- ❑ **Road centrelines:** This layer contains road locations as well as road names, used later to label the roads on ArcIMS.
- ❑ **Address points:** Each point in this data layer contains the street address of the property on which the point is located (e.g. 33 Long Street).
- ❑ **Suburb boundaries:** These suburb data will be appended to the factory shop points and used in ArcIMS to structure queries that tourists can use to locate factory shops in a certain area.
- ❑ **Zoning for erven:** The zoning will be used to give tourists an indication of what type of area they will be visiting. The erven containing factory shops will be grouped into zoning categories.

Of the above layers, only the road centrelines and the outer suburb boundaries will be displayed on the Internet. The other layers are only for use during the capturing process. Figure 3.3 represents the steps involved in the capturing process.

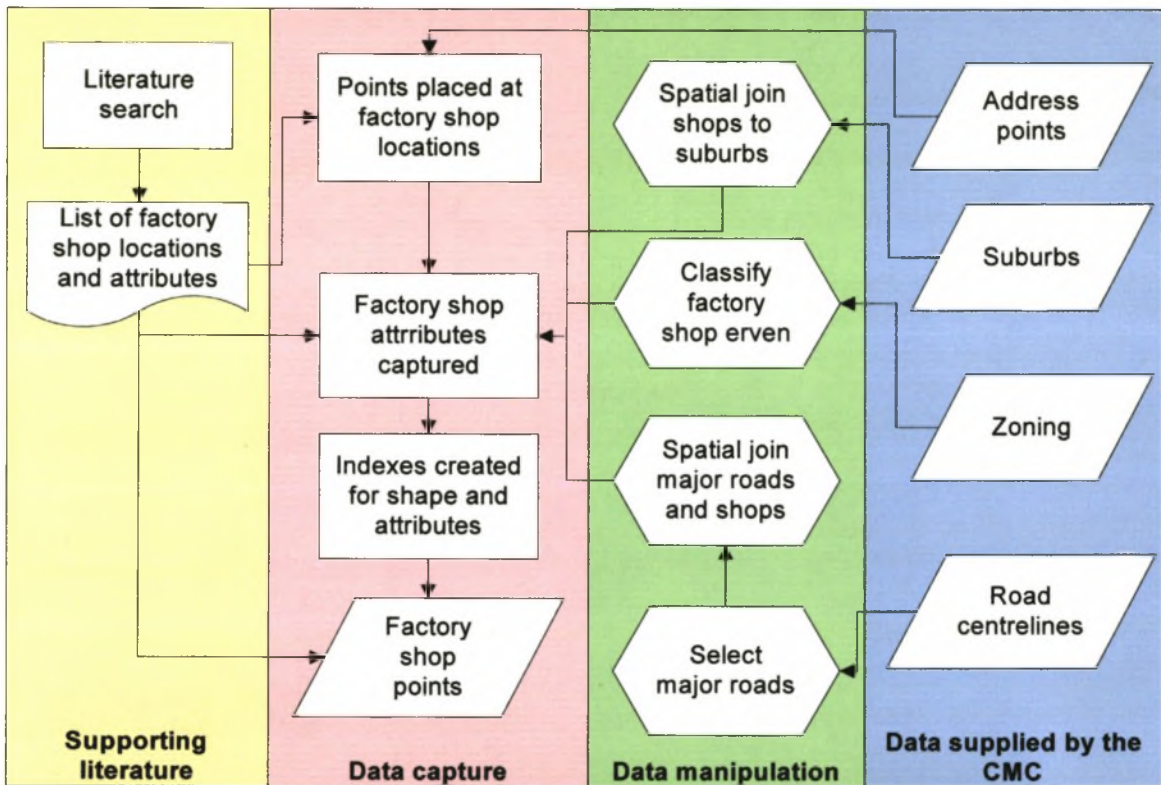


Figure 3.3: Steps in capturing and deriving data for the interactive map

3.3.1 Locating the factory shops

The factory shops were principally located using information gleaned from *The A-Z of factory shops in the Western Cape* (Black, 2001) as this directory contains the locations of most of the factory shops in the CMA. The book lists shop names, merchandise, telephone numbers and in some cases shop addresses. It also contains a map for each suburb, indicating where the factory shops are. The addresses as well as the maps are created for factory shoppers who need to locate a shop while driving in an unfamiliar area. Unfortunately, the shop locations are often not given as accurately as they should be. In the database the points representing the factory shops were placed according to their addresses or relative to landmarks as accurately as possible. However, the

locations of the points representing the shops remain inaccurate in some cases due to a lack of locational information.

The other sources of data were more accurate in locating factory shops. These data sources included pamphlets gathered at the Factory Shop Show, at factory shops or in factory shop malls (Appendix D contains a sample of these pamphlets). The pamphlets contain maps showing where the shops are and provide accurate addresses for the shops. The pamphlets also include the telephone numbers and short descriptions of the merchandise sold in the respective shops. Newspaper advertisements were also a good source from which to locate factory shops. These advertisements contain the same type of information as the pamphlets, but appear more often in the local weekly newspapers, such as *The Tatler*, compared to the daily newspapers such as *The Argus*.

To capture a shop the researcher first searched the road centrelines database and selected the road that a shop was in. Zooming in closer to this area allowed the researcher to identify the part of the road where the shop is located. The point representing the factory shop was then placed using the shop's street number. To make the placement of the shop more accurate, the point was snapped onto the address layer obtained from the CMC. Where a shop was located in a business park or did not have a street number, its location was approximated and a point was placed to represent it as accurately as possible. Once the point representing the factory shop had been placed, the shop was incorporated into one of the predetermined primary and secondary categories.

3.3.2 Categorising the shops

The factory shops were categorised primarily according to the merchandise they sell. Grouping shops selling similar types of merchandise together created the factory shop categories. Category names were chosen to encompass these groups of merchandise, for example the food category. The primary categories created contained a general description of the merchandise. Within each primary category secondary categories were added to describe the merchandise in more detail. (Table 2.1 lists the primary and secondary categories).

The first category, Clothing, includes clothing for men, women and children as well as clothing accessories and leather goods. Sewing wares and material were included as a secondary category within the clothing category since so many shops offer both clothing and clothing material.

The second category, Food, includes all foodstuffs from frozen to fresh. One of the secondary categories in this primary category is Speciality Foods, which includes Mexican foods and spices.

The third primary category created was Homeware. This category includes all crockery and cutlery as well as furniture and carpeting. One of the secondary categories contains cleaning materials, since they are most often used in the home.

The final primary category, Miscellaneous, contains all the factory shops that sell a variety of merchandise and those shops whose merchandise does not fit into one of the other primary categories.

Table 2.1 also lists the number of shops per secondary category. In some cases there is only a single shop listed for a secondary category. This is usually an indication of incorrectly chosen categories, since a category should contain at least two or preferably more items to normalize the database. In these cases it was necessary to create secondary categories, since the merchandise offered in these shops could not be placed within another category. Furthermore, the secondary categories that have been created list the types of merchandise that factory shoppers would be particularly interested in.

3.3.3 Capturing additional shop information

Once all the factory shops had been captured, additional data were derived and assigned to each shop to make locating the shop easier and to give the tourist visiting the shop a better idea of the area where the shop is located.

Many of the addresses listed for the factory shops in the source data contained the suburb where the shop is located. However, this often did not conform to the suburb boundaries set by the CMC. This was overcome by adding the suburb information to the factory shops by spatial joining of the shops with the CMC suburb data. The spatial join assigns the suburb name based on the location of the shop. In cases where the suburb boundaries follow the road centrelines, a shop on the right side of the road was assigned a different suburb to the shop on the left side of the road. This makes the suburb names assigned to the shops more accurate than those listed in the source data used to locate the factory shops.

When attempting to locate a place of interest it is always helpful to know the closest major road to the site. Tourists can use this knowledge to immediately locate the correct area in a suburb or even to locate a starting point from which to begin their trip. Furthermore, by listing the distance from the major road closest to the factory shop, tourists can get an idea of how long or how far they will have to travel from the major road. This distance calculation was done using a spatial join between the factory shops and the major roads layer. (The method used to create the major roads layer was set out in Chapter 2). This distance is measured in a straight line from the factory shop to the road. The driving distance to each shop could have been calculated, but one would have needed to define points from where trips commence. This could be argued to be the point where one turns off the road to the shop. However, this turnoff could be placed at any of the many off-ramps or stop-streets along the major roads. Each of the starting points would need to be individually decided on and placed. Creating this type of routing scheme would require a study on its own, so has not been included here.

In addition to adding the suburb name and distance from a major road to the factory shop data, one can also add the zoning of the erf on which the shop is located in order to give an idea of the nature of the area where the shop is located. Since it is not customary to make zoning information public knowledge, each shop was assigned a category of zoning. The categories are industrial, commercial, various or unknown. This proved to be difficult since the five former municipalities constituting the City of Cape Town Administration had separately captured the zoning information (as mentioned in Chapter 2). The data from each municipality had to be collated into a single zoning file and spatially joined with the factory shops. Each shop was then assigned one of the four categories. The addition of the above information to the attribute data for the factory shops makes the points representing them quite useful to the tourist. However, for the data to be truly useful they need to be displayed quickly over the Internet.

3.4 FORMATTING THE DATA

Because the data are to be displayed on the Internet, certain adjustments had to be made. Of the data originally obtained from the CMC, only the roads layer was used in creating the map to be displayed on the Internet. The other layers consisted of data that were either derived from the CMC's data or captured from scratch as in the case of the factory shop points. The layers containing derived data are listed below with the methods used to derive them.

- ❑ CMA boundary: created by merging all the suburb boundaries into one polygon.
- ❑ Major roads: created by selecting only the expressways and arterial roads from the roads layer.

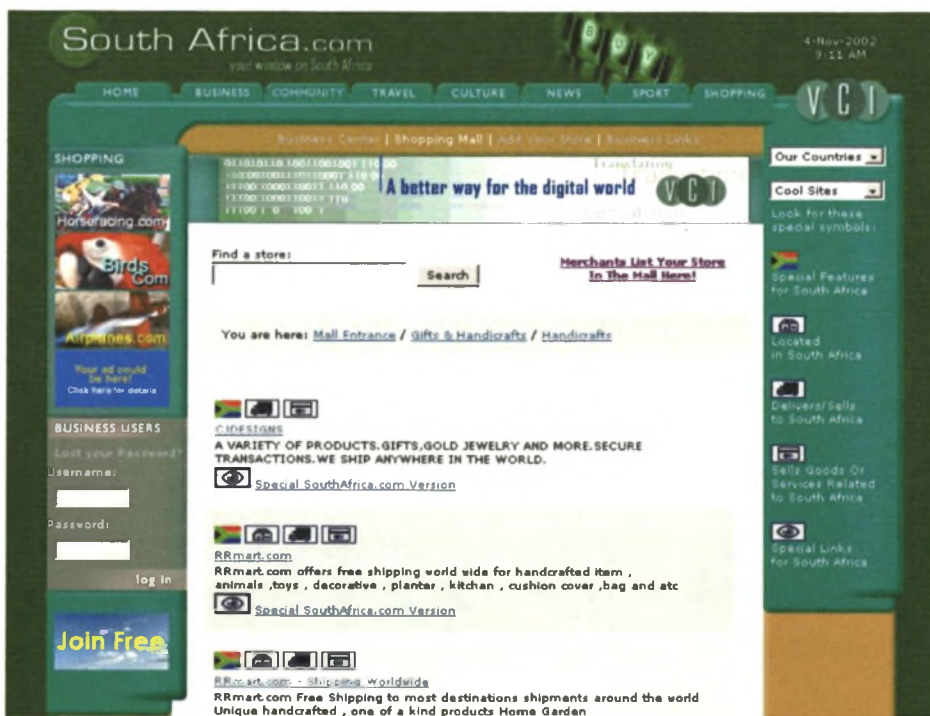
These layers were generated mainly to minimise the load on the web server. The more data served over the Internet by the Internet map server (IMS), the slower the map becomes. The suburb boundaries were not considered vital information for the map, but the names of the suburbs were required. By spatially joining the suburb names to the factory shop points it became unnecessary to display the suburb boundaries. However, it was felt that users would want a polygon showing the Cape Town coastline so that they could orientate themselves as to where they were in the city. Merging all the suburb boundaries from the suburb layer into a single polygon created this polygon which is displayed purely as background data in the map.

Roads are often used as a method of locating one's position on a map; they remained an integral part of the map, but were too large to display when viewing the entire CMA. In order to minimise the load on the IMS during small-scale displays, the major roads layer was used instead. The creation of this layer was recorded in Chapter 2.

In addition to removing non-vital information from the map, the information remaining was optimised. For each feature displayed a spatial index was created. This improves drawing speed by a few milliseconds on a local computer and offers a slightly faster display over the Internet. To maximise the speed of any queries on the different layers, attribute indexes were created. These indexes were created only for the fields that were to be queried and not for those that would be displayed as additional information. While an attribute index increases the speed of a query on a field, it also makes the data files larger, so it was vital to achieve a compromise between the two. Once the data had been optimised for display and query, they were ready to be used in the creation of the factory shop website. This exercise is reported in the next chapter.

CHAPTER 4: ADDING INTERNET CAPABILITY TO THE DATA

According to Inkpen (1998) over 3 million European homes had Internet access or subscriptions to online services in 1998. Clearly the Internet is an excellent method of marketing South Africa to the masses of potential tourists overseas. Inkpen (1998) further stated that Forrester Research believed that Web-generated global sales would rise from \$2 billion in 1996 to \$61 billion in 2000. Sweeney (2000: xxii) quotes statistics, from the Travel Industry Association of America, showing that online travellers have increased by 190 per cent between 1996 and 1999. Many Internet sites have taken advantage of this fact. One South African website (see Figure 4.1) even offers South African curios for sale.



Source: www.southafrica.com

Figure 4.1: Shopping on a South African website

The Internet has also become a tool that people use to research topics. Tourists travelling to a new destination often use the Internet as a research tool to locate activities they can enjoy and sites they can visit. South African Tourism's (SAT) website in the UK offers maps, itineraries and the opportunity to order travel brochures. The City of Cape Town has noted this need for websites

marketing tourism activities in Cape Town and has created an official City website (www.gocapetown.co.za).

In the CMA ArcIMS is widely in use on the local authority Intranet to locate and distribute geographical data. However, this technology is not currently widely available to assist tourists in their trip planning, due to the sensitive nature of some information (Stavridis 2002 pers. comm.). Tourist bureaux in Cape Town offer much tourism information and tourists looking for activities tend to flock there to gather pamphlets describing the local facilities, amenities and services. They then need to locate venues on a map and arrange transport to these venues before they can participate in any of these activities. By using ArcIMS tourists can search for activities, or in this case factory shops, and then having found the one they want to visit, they can print a map of the location. An additional benefit of this technology is that a tourist can print a map to use for visiting various places on one-day round trips, and not plan individual trips to each place using the promotional maps showing the directions to a single venue.

4.1 WHY USE ARCIMS?

“The tremendous growth in Internet use has resulted in an increased demand for the delivery of geographic data, maps, and applications over the Internet” (ESRI 2001b: 12). GIS has naturally evolved into using the Internet as a tool to serve interactive maps to users. These maps offer some of the basic GIS functionality without requiring specialised software to be loaded on the user’s local computer.

Environmental Systems Research Institute (ESRI) has developed ArcIMS to enable users to serve geographical data onto the Internet. ArcIMS allows the user to interact with the map by zooming in and out and panning around the map. The user can also request information on map features using tools such as the query or identify tools. The number and complexity of tools that can be made available to the user depend on the format of the map viewer. Of the two formats available, the HTML format offers fewer tools than the more complex Java format.

This method of serving geographical data to Internet users requires no specialised software on the user’s local machine. ArcIMS requires no license or specialised applications other than Microsoft Internet Explorer to be loaded on the client computer loading the Internet map. Should the user load a map which uses the Java viewer, Internet Explorer will automatically request the computer

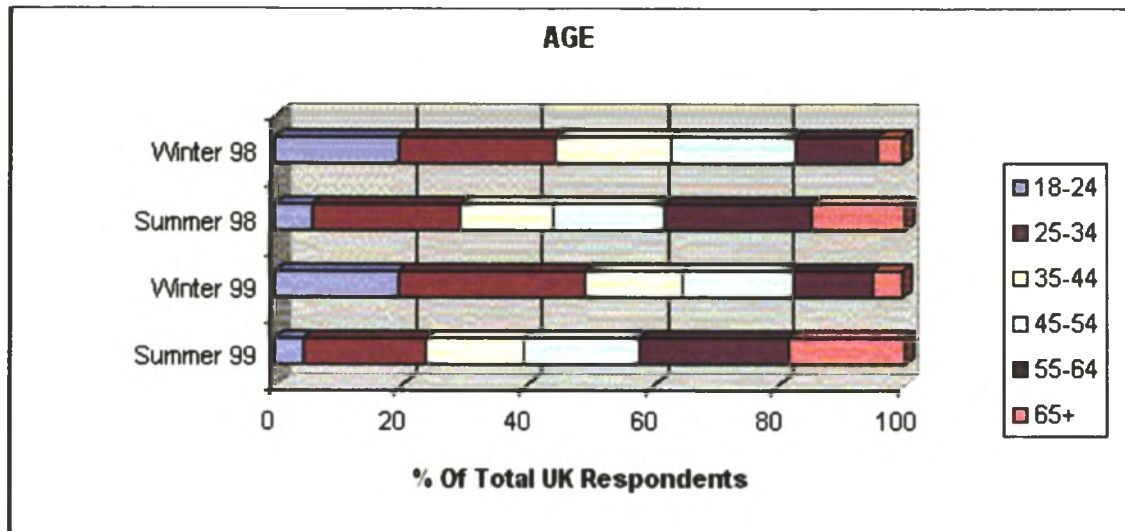
to download Java applets. These applets will allow the local computer to run the complex functions in the map viewer.

The real obstacle for most users may not be the computer specifications needed, but rather the technical expertise required. The users of this website should find the site easy and user-friendly. Research on the target audience was necessary to determine the additional functionality that should be added to the website and what level of computer literacy the help web pages should be aimed at.

4.2 THE TARGET AUDIENCE

The users of a website promoting tourism and factory shops will come from all walks of life and have local and international origins. The visitors to this website would also vary in their knowledge of the Internet, computers or GIS. To address these circumstances, each button that is used on the ArcIMS viewer will be explained in a web page preceding the site. The user will connect to the website and be able to access these help web pages first, from where the user will be able to open the web page containing the ArcIMS viewer.

Lawson (2000) notes that young couples and retired couples tend to spend more time shopping and are more likely to hire cars when travelling. South African Tourism's website in the UK offers statistics on tourists visiting South Africa. South African Tourism (2002) indicates that the tourists from the UK make up 24 per cent of the total number of tourists visiting South Africa from outside Africa. In Figure 4.2 approximately 20 per cent of these tourists represented are between 25 and 34 years old and a further 20 per cent are between the ages of 55 and 64 years. This would seem to indicate that there are a large number of tourists visiting South Africa who would be interested in shopping and have access to transport allowing them to visit factory shops.



Source: South African Tourism website, www.satour.co.uk (2002)

Figure 4.2: Percentages of tourists to South Africa from the UK according to age group

According to Hendricks (pers. comm.) the younger tourists, between the ages of 20 and 30, are interested in shopping at factory shops. He added that older tourists also show an interest in factory shopping, but are more interested in buying clothing for their children than for themselves. Seybold (1998) advises that one should focus on one's most profitable set of end clients. The design of the map viewer should therefore be undertaken with the aim of making it 'user-friendly' for younger tourists.

Consumer theory assumes, first, that consumers have limited income; second, that consumers act in a rational manner; and third, that consumers aim to maximise their total satisfaction, subject to their constraint of limited income (Tribe 1995). It is thus natural that customers would want to maximise their shopping experience by shopping at stores where the merchandise is cheapest. Roldan (2001) classifies customers into four orientations, namely recreational, experimental, convenience and economic. Customers with an economic orientation wish to obtain the best value for their money and are thus the customers who are most likely to be interested in factory shops.

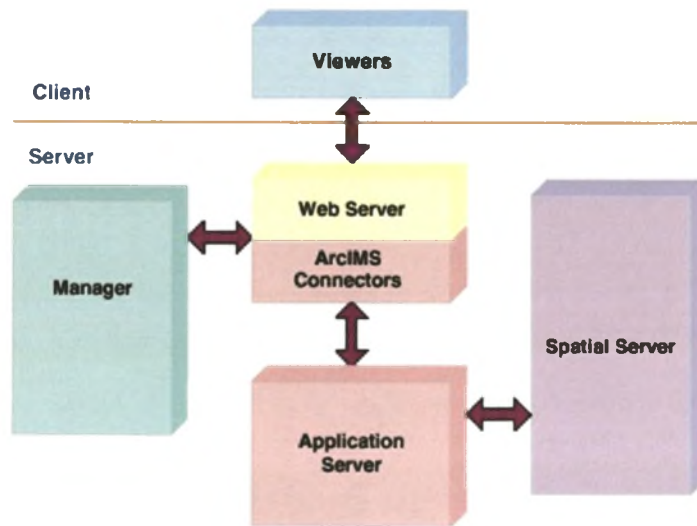
The facts seem to point to younger tourists being interested in visiting factory shops to buy South African merchandise at reasonably low prices. Hendricks (pers. comm.) points out that the younger generation of tourists often arrive with very little clothing and have a limited budget with

which to buy more. These young tourists tend to have Internet know-how and most often have access to the Internet at home.

Internet connections around the world differ in speed. In South Africa the Internet connections available at home are often slow, with users paying high telephone bills or Internet Café bills to access and download information. For the website to be a success it needs to be fast enough to keep the user interested. Should users have to wait more than a minute to download information, they tend to resort to other methods of finding information. Therefore a major challenge for the factory shop user-interface is to keep it simple. The user should not have to know anything about GIS to operate the ArcIMS viewer. A web page explaining the tools available in the ArcIMS interface would allow any user to learn the basics of using the ArcIMS viewer quickly. This approach has been used in Cape Peninsula National Parks' (CPNP) interactive map where users are often new to GIS and have not yet been introduced to the various tools available (Benn pers. comm.). Benn's (pers. comm.) approach has worked remarkably well at CPNP, resulting in more and more users requesting access to the web pages and other parks requesting the technology to serve similar information to their users. For this study help web pages will be used to familiarise the audience with the map viewer interface. Hyperlinks from these discussion pages will allow them access to the map viewer.

4.3 SETTING UP ArcIMS

Roldan (2001) notes that companies are still trying to understand and harness the Internet to reach and maintain their target markets effectively. ArcIMS is somewhat easier to understand than most Internet technologies. However, before beginning a website design one needs to understand the ArcIMS architecture. Figure 4.3 shows the different ArcIMS modules and how they connect to each other.



Source: ESRI (2001b)

Figure 4.3: ArcIMS architecture

The ArcIMS components are divided into two categories – client and server – as denoted in Figure 4.3 by an orange line. The server-side components control the ways data are distributed over the Internet. These components manage and serve the spatial data as well as monitor the website traffic. The client category of components allows the user to connect to the website. All of the components on the server side of ArcIMS usually run on a single web server, but can be loaded onto multiple computers. These components include the ArcIMS Manager, the web server, the ArcIMS connectors, the application server and the spatial server.

The ArcIMS spatial server is the backbone of the ArcIMS website (ESRI 2000). This server processes the client's request for data by creating a file and transmitting it to the client. This request could include creating an image of the map to send to a client or streaming map features to the client. In addition to these tasks the spatial server also performs the processes that are required to return a result for the tools used by the client. These processes include selecting features that meet a client's query, buffering features, or calculating routes between two points. The ArcIMS monitor and the ArcIMS tasker both support the spatial server. The ArcIMS monitor tracks the state of the spatial server and will switch it on should the web server be rebooted. The ArcIMS tasker removes any output files that the spatial server has created after a specified time interval has elapsed.

The ArcIMS application server handles incoming requests from the client and monitors their progress on the spatial server. The ArcIMS application server is connected to the web server with the ArcIMS application server connectors. These connectors act as an interface between ArcIMS and the web server and allow a programmer to incorporate the ArcIMS viewer into a programme.

The ArcIMS manager allows the website creator to administer the website as well as design new web pages and author new maps. One can use the wizard-driven version of the manager, which is available over the Internet, or one can use the ArcIMS Author, ArcIMS Designer and ArcIMS Administrator applications located on the web server. The advantage of using the web-based manager wizard is that one can access it from any location that has an Internet connection. ArcIMS Author allows one to create the map to be served over the Internet. The ArcIMS Administrator creates the service, which will serve that map. Finally ArcIMS Designer uses the service created in ArcIMS Administrator to design the website in which the client will view the map. These components will be discussed in more detail in the next section.

The website visitor uses the viewer module of ArcIMS to view the geographical data that are transmitted over the Internet. ArcIMS contains three types of viewers: the HTML viewer, the Java viewer and the Java custom viewer. Each viewer can serve data in either feature format or image format. Feature format streams the geographical features (points or polygons for example) over the Internet. This allows the user to interact with the features, such as buffering them. An image service transmits a snapshot of the map over the Internet. An image service only allows certain functionalities to be used. For example, one cannot use the map tips button, which displays a label for a feature, as the mouse moves over the feature. The map tips button requires the features to be present and cannot work on an image.

Choosing the type of viewer to use is critical and involves asking a series of three questions. The answers to these questions determine what type of service (feature or image) will be used to serve data to the ArcIMS viewer and what type of viewer (HTML or Java) will be used to view it.

The first question is who will use the ArcIMS viewer? As discussed in the previous section, the users will want a simple yet interesting application that is fast and easy to use. The HTML viewer contains fewer tools than the Java viewers. For this factory shop website the extra tools available only in the Java viewers are not necessary. Both viewers can be customised with respect to appearances so the HTML viewer will look as interesting as the Java viewer.

The next question is how fast the network is that the client is using? In South Africa the Internet is not as fast as it is overseas. Since South African users and tourists in South Africa will also use the viewer, we need a viewer that is fast to use. The HTML viewer will operate without requiring the client machine to download many additional Java applications. The viewer will be faster should it make use of an image service rather than a feature service.

The last question is what type of data should be transferred to the users? For this website the required outputs are a display of the chosen factory shop on the screen and a printout of the screen display. This does not require any special GIS functionality to be present in the viewer; it requires only a snapshot of the data. It would thus be prudent to use an image service since this type of data is faster to download than that provided by the feature service.

It follows that the factory shop viewer should have the following characteristics: it must be fast, easy to use, be able to process requests for data, and receive that data quickly. These characteristics suggest that the HTML viewer and an image service should be used.

4.4 AUTHORIZING A MAP

Creating an ArcIMS website requires a series of steps, beginning with authoring a map, followed by creating a service and designing a website. Figure 4.4 shows the progression of steps in creating a website, with each step highlighted in a different colour. Authoring a map is the first part in the process of creating an ArcIMS website. The ArcIMS Author (see pink highlight) allows the user to create the map that will be displayed on the website. In ArcIMS Author the user can specify which layers (see purple highlight) are loaded, at what scales they display and their symbology.

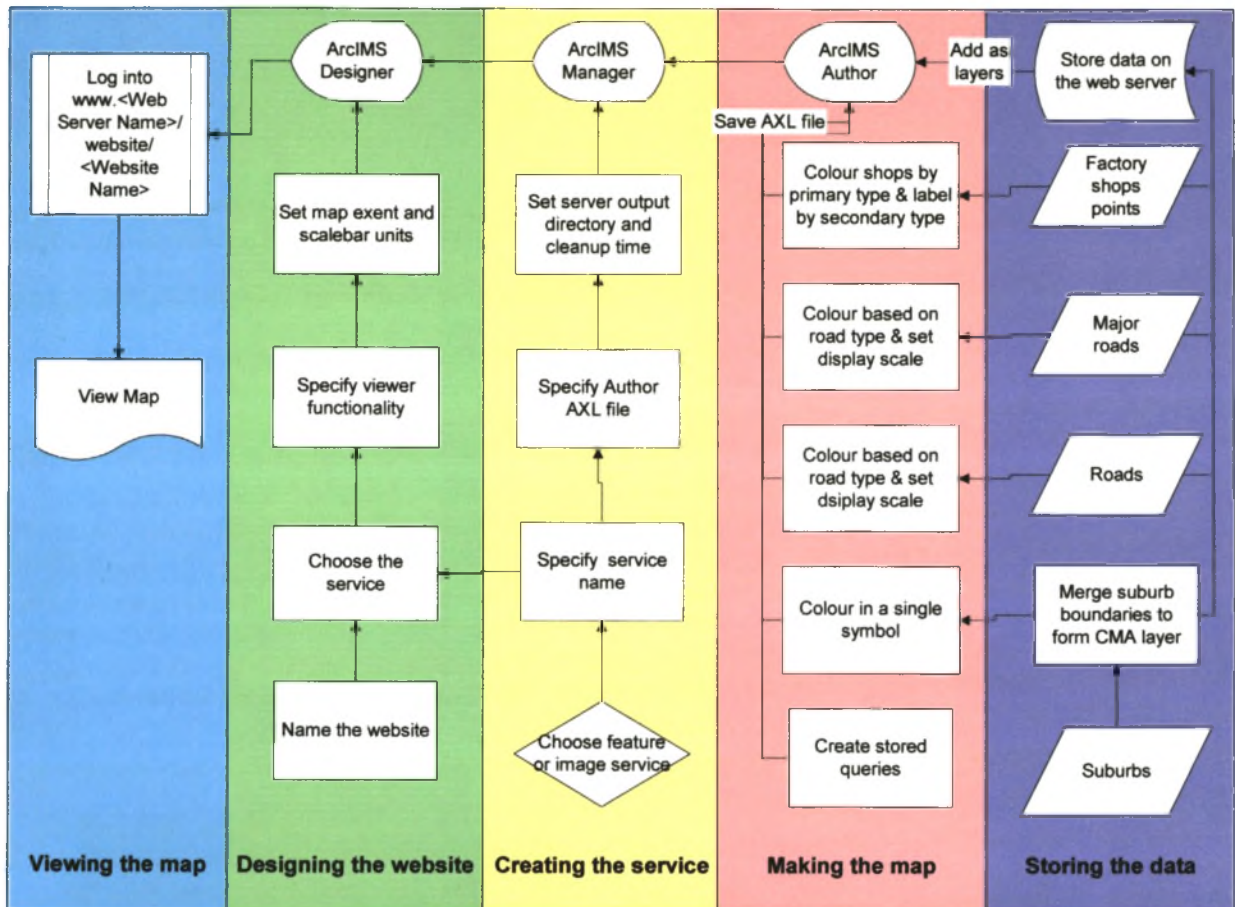


Figure 4.4: ArcIMS interactive map design process

To create a new map, one begins by adding the layers that are to be displayed. To minimise the amount of data travelling over the Internet one should load as few layers as possible. For this study the following layers were added to the map:

- ❑ Factory shop points
- ❑ Cape Metropolitan Area (CMA) boundary
- ❑ Road centrelines for all roads in the CMA
- ❑ Road centrelines for the expressways and arterial roads in the CMA.

Next, the layers are symbolised and their individual scale ranges set. The symbolisation of layers is important since the user will perceive features with larger symbols or darker colours as important. The researcher found that when shown maps depicting polygons with lighter and darker shades and when shown symbols of different sizes, approximately 70 per cent of approximately 100 GIS students attending the official ESRI courses, chose the darker colours or larger symbols as denoting objects of more importance. The human eye is limited in its ability to decipher differences between more than 12 colours and more than seven or eight distinct shades of a single colour (ESRI 2001a), therefore each type of feature was symbolised in a distinct colour to avoid confusion when identifying the different types of features in the map.

The CMA boundary was created to act as a layer of orientation for the users of the map. The layer was coloured light green in order not to detract from the prominence of the other layers. This layer is always visible so that the tourist can view the whole CMA or zoom in to see shops along the coastline.

The major roads and roads layers were symbolised using the same symbols. A thin black line represents the local streets, a thicker black line represents the main roads and a thick red line represents the expressways. Individual display scales were assigned to each layer. The major roads layer displays until the user zooms to a scale of 1:50 000, at which point it switches off and the roads layer switches on (see Figures 4.5 and 4.6). The roads layer has been labelled using the road names. These labels contain their own display scale and will only display on the map once the user has zoomed up to a scale of 1:13 000. By displaying the road names at this scale the amount of data being transmitted over the Internet is reduced and the load on the web server is minimised.

shop has been labelled using the secondary type field. These labels are scale-dependent and only display at a scale of 1:13 000. Once again, this reduces the amount of data being transmitted from the web server to the client.

Once all the layers in the map have been symbolised and any additional functions have been set, the map can be saved as an AXL file under the ArcIMS AXL directory. This file saves all the changes that have been made and allows ArcIMS Author to be closed and the creation of a service to begin.

4.5 CREATING A SERVICE

The map services are created using ArcIMS Manager (see the yellow highlight in Figure 4.4). The ArcIMS manager allows the administrator of the ArcIMS website to start and stop services as well as set various properties for those services.

The ArcIMS manger will require a password before allowing access to the application. To create a new map service one chooses the services category on the left side of the window. Clicking the new service button accesses the new service window where one can specify the website's name. Next, supply the name of the AXL file saved in the authoring process. Specify whether the website will serve images or features by choosing an image or feature service. One can accept the remaining field defaults supplied by ArcIMS and close the ArcIMS Manager. When the service has been created, the website administrator can begin to design a map viewer. This viewer will display the AXL file by using the service.

4.6 DESIGNING A WEBSITE

In this study the type of data that will be served over the Internet only requires an HTML viewer which defines the look of the web page and the functionalities available in it. JavaScript files run the functionality in the viewer and HTML pages within the viewer define the location of different viewer panels. The website administrator can customise the HTML viewer by changing the different HTML pages or the underlying Java files. It is possible to customise the HTML viewer in three ways, namely by changing the layout or graphics in the HTML frames; by changing the type of tools and their icons; and by adding new tools or functions.

The HTML viewer was chosen to display the data in this study because of its advantages. Included in these advantages is the fact that the viewer performs less processing on the client machine than the Java viewer does. The target audience for this website is tourists between the ages of 20 and 30 years. These users are not likely to have GIS knowledge, so the fewer tools in the map viewer, the less likely it is for the users to become confused over which tools to use. For the purpose of this study it was decided to display only the tools needed to complete the search for shops and not to display additional tools.

To design a website the ArcIMS Designer (see green highlight in Figure 4.4) is opened and a name for the website and website directory typed in. Next the service to use in the site and the viewer is chosen, in this case HTML. Then set the units for the scale bar and choose the tools to display on the website. Accept the rest of the defaults and finish the design process.

To test the website (see blue highlight in Figure 4.4) open Microsoft Internet Explorer and go to the location of the web server and use the following path: www.<web_server_name>/website/<Website name>/run.htm. The map viewer should display and retrieve the map as it was designed and saved in the AXL document (see Figure 4.7).



Figure 4.7: Default view of the factory shop map

Now that the ArcIMS site has been created one can begin designing additional help web pages for the website or begin testing the website. In the case of the factory shop website it was imperative to have some form of help page to assist the users in using the website. These pages should be kept simple and the links to the ArcIMS HTML viewer should be easy to find so that the user does not waste time downloading complex graphics or searching for hyperlinks. Chapter 5 will discuss how to complete the website by adding additional web pages and ArcIMS site starters.

CHAPTER 5: FACTORY SHOP WEBSITE COMPOSITION AND TESTING

Once the map viewer had been created, the researcher tested it using various computers and various connections to the Internet. It was found that the map viewer displayed quickly on a network with a large bandwidth (56 or 128Kb) at its disposal, but displayed slower using a 32Kb or slower dialup connection to the Internet. This presented a problem since it is unlikely that tourists will have access to a high-speed Internet connection.

To remedy this problem a search site starter was downloaded from the ESRI website in the hope of increasing the speed of the factory shop website. The search site starter allows the website author to create an application that searches a field in an attribute table for a user-specified value. A list of all features found is then displayed and the user can click on a feature and retrieve a map of that feature at a preset scale. This site starter was customised to work on the factory shop data and added to the final website. It did not replace the current ArcIMS viewer, but was added as another hyperlink on the web page. Help pages were created to explain to users how the site starter works and these were added as hyperlinks on the default web page.

5.1 THE FINAL SITE

The final website did not only include the ArcIMS viewer, but additional web pages detailing the website usage. This website is available at <http://gimsims.gims.com/factoryshops>. This web page was created using Microsoft Front Page and offers tourists all the information they require when accessing the website. The opening web page (see Figure 5.1) contains a main page with information about the website in general. Hyperlinks to the map viewer and the search site starter are contained on the right-hand side of the default web page and hyperlinks to other documents discussing how to use these sites, as well as a feedback form and a web page for frequently asked questions (FAQ), are displayed on the left of the default web page.

Factory shops in Cape Town

[Search this site](#)



[How to search for a shop](#)

[How to use the interactive map](#)

[What information is available for the shops](#)



[Frequently Asked Questions](#)



[Feedback](#)

Welcome to the first tourist website in South Africa to offer an interactive map of factory shops. This website will allow you to search for factory shops by name or according to the merchandise they sell. You will also be able to locate all the shops within a suburb.

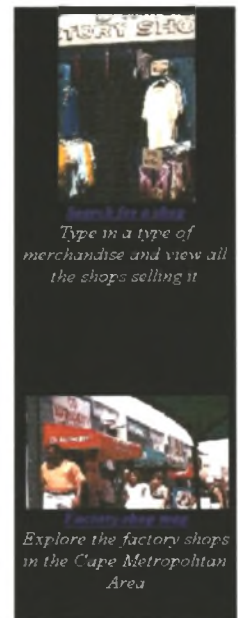
Use the hyperlinks on the right side of the page to search for a shop or to use the interactive map.

Use the hyperlinks on the left side of the page to learn more about how to use the search tool or the interactive map.

This website is part of a Masters thesis in Geographical Information Systems at the University of Stellenbosch. It is thanks to the kind donation of data from the [Cape Metropolitan Council](#) that this map can be created. Further it is thanks to the donation of server space and bandwidth from [Geographical Information Management Systems](#) that this site can be sent to you.

This site exists purely for the purpose of research and has in no way been created for monetary gain. The author holds no responsibility for any inaccuracies in the information on this site. Please verify shopping hours and merchandise availability with the factory shops.

Please make use of the feedback page to give your views on how this site can be improved.



Source: gimsims.gims.com/website/factoryshops

Figure 5.1: Factory shop website default web page

The hyperlinks on the left-hand side of the default page allow the user to view the web pages with the following names:

- ❑ Search the site: This page allows the user to search these web pages for a specific topic.
- ❑ How to search for a shop: This page contains a list of instructions on how to search the database for a type of merchandise using the “Search for a shop” hyperlink on the right-hand side of the web page.
- ❑ How to use the interactive map: This page contains pictures of the buttons available in the ArcIMS viewer and descriptions of how these buttons work.
- ❑ Frequently asked questions (FAQ): This page contains answers to questions that the user might ask, for example “Where can I get ArcIMS or where did the author get the data?”.
- ❑ Feedback: This page contains a feedback form, requesting the user’s name and any comments the user might have. This allows the user to send comments about the website to the website author.

Within the default web page hyperlinks to the University of Stellenbosch and ESRI are included.

By using the above pages, the website user can learn about the ArcIMS programme or the data being used in the map before making use of the map to locate factory shops.

In the ArcIMS viewer tourists have the option of searching for the factory shop they are interested in by using the find tool (see Figure 5.2) and typing in the word they wish to search for in the attribute table, for example “juice”. ArcIMS will then display all the factory shops (see Figure 5.3) meeting the criterion (in the case of the example all the factory shops selling juice will be displayed). The tourist is able to read all the attributes of all the shops and view them on the map, where they all have a yellow symbol to denote that they have been selected. Should the tourist decide to visit a shop, he or she can click on the number next to a shop name, the viewer will zoom to the shop and a map can then be printed that can be used to visit the shop.



Source: gimsims.gims.com/website/factoryshops

Figure 5.2: Using the ArcIMS find tool to find a factory shop



Source: gimsims.gims.com/website/factoryshops

Figure 5.3: Results of using the ArcIMS find tool to find a factory shop

The search site starter works in the same way as the find tool and uses a similar image service to search the factory shop layer's attributes and display a list of the items found. The main difference between the ArcIMS viewer and the search site starter is that the site starter returns a static map to the user which does not contain any zoom or pan tools and is ready to be printed.

5.2 SITE EVALUATION

Once the website had been completed, the website address was sent to GIS professionals, factory shoppers and various contacts overseas. It was necessary to gather views on the website from users with different levels of GIS and Internet competency. Taiwanese, Australian and American GIS specialists were asked to visit the website, and deliver their comments. Of the South Africans asked to test the website, one of the most noted must be Dr Richard Knight who is experimenting with ArcIMS at the University of the Western Cape. Visitors to the website from Stellenbosch University were the study supervisors. Specialists in GIS from GIMS and GISCOE commented on the website and found it to be fast and useful (Van Lill pers. comm.; Louw pers. comm.). South

African factory shoppers were also asked to test the website as well as some South Africans who had not yet been factory shopping (Macgregor pers. comm.).

One of the first comments received from three users was that the website was too slow to view. A week later, while trying for the second time to view the website, it was found by respondents in the UK and South Africa that the site was faster (Terrapon pers. comm.; Cawood pers. comm.; Van Niekerk pers. comm.). This phenomenon was reported to the web server technician, but no cause was found. Comments from two users, pointed out that the website was difficult to understand, but the addition of the web pages dealing with website usage resolved this problem (Terrapon pers. comm.; Cawood pers. comm.).

The testing of the website was brief and limited to persons known to the researcher, however some of the people testing the site forwarded the request to their friends who also tested it. Chapter 6 reiterates the goals of the study and comments on whether they were achieved successfully. It also lists problems encountered during the study and suggests ways to improve the website.

CHAPTER 6: RESEARCH FINDINGS

This research had three basic goals, namely

- ❑ to capture the location and attributes of all the factory shops in the CMA;
- ❑ to place these shops on the Internet using an interactive map; and
- ❑ to test the map.

All the factory shop locations have been captured and attributes for these shops have been entered into the database. Additional attributes have been derived from other data layers and added to the factory shop data. These data layers were used to author an interactive map which was displayed on the Internet using an ArcIMS viewer and image service. Additional web pages were created to guide the user in using this site and an additional service was added to the site as a faster alternative to searching for a factory shop using the ArcIMS viewer.

The website, including viewer and default web page, was viewed by users with GIS experience and those without. The website address was sent to potential users both locally and internationally. They commented on the speed of the website and its user-friendliness. However, problems with the website were experienced, which resulted in certain parts of the site being unavailable to the users.

6.1 ADVANCED ArcIMS CONFIGURATION

This study has investigated the HTML viewer as a tool to create an interactive map for tourists. However there are many different applications for this technology and many ways to customize it. This study would not be complete if the possibility of customizing the viewer was not researched. The following alterations can be made to the viewer using XML, Java script or HTML:

- Administer map services
- Alter the default map display
- Render data

- Project data
- Query data
- Customize map tools
- Add new tools to the viewer.

The viewer needs to be as simple as possible to understand and operate since tourists who might not have much experience in operating the Internet will use it. Many of the changes that can be made to the viewer only increase its complexity and few of the customisations will assist the tourist to operate the viewer.

One of the alterations that can be made to the viewer is the customisation of the identify tool. This tool is used to click on a factory shop on a map and view the information about the shop. The tool uses a radius around the mouse pointer to determine which factory shop's information to display. Often one needs to click exactly on a point representing a factory shop before its attributes are displayed. By increasing the radius slightly it becomes easier to click on a factory shop point and thus easier to use the tool. Increasing the `pixeltolerance` variable in the `arcimsIdentify.js` file on the web server was used to alter this radius.

The ability to display the factory shop information in a separate Internet Explorer window is another customisation that could increase the utility of the viewer. The factory shop information is normally displayed below the map inside the viewer window, thus limiting the space in which this information can be viewed. By setting the `UseExternalWindow` variable to true in the `ArcIMSParam.js` file, a new window is used to display the information. This new window can be resized to accommodate the size of the information table's columns.

In addition to altering the variable in the files and customizing the HTML viewer, there are other things that can be done to make the factory shop website more user-friendly. The following section discusses some improvements that can be made and some options for on-line shopping.

6.2 WEBSITE IMPROVEMENTS

This research focused on serving data over the Internet to which end a website was created to allow users to access this information. There are a number of additions that can be made to the site to make it user-friendlier to international tourists.

Sweeney (2000) suggests promoting websites through e-mail, or by adding their addresses to search websites. This would have to be done carefully to avoid encouraging tourists who will not be able to understand the website's language. It follows that an obvious addition is the option of displaying the web pages in various languages. This would make the website and ArcIMS viewer user-friendlier for non-English-speaking tourists. The information in the factory shop attribute table could also be translated, however, this is an arduous task.

Another possible improvement would be the addition of personalised pages such as "My favourite factory shops", i.e. implementing so-called matching. Roldan (2001) calls matching one of marketing's earliest approaches to web marketing; it allows the company to align its products with the preferences of the customers. Each visitor to the website could save maps to his/her favourite factory shops and not have to search for them over and over again.

Stavridis (pers. comm.) says that the City of Cape Town is implementing an ArcIMS architecture that will allow all government employees access to the data created for Cape Town. The implementation of this architecture has called for multiple servers to balance the load of visitors to the website. The servers will be joined and any requests by the ArcIMS viewers will be split between the machines to make the website as fast as possible. Prior to this the single server serving this data on the Intranet was so popular that it crashed after a few days since it could not cope with the number of visitors to the website. The multiple server architecture using load balancing could be implemented should the factory shop website begin receiving a large number of visitors.

To improve the marketing aspect of the factory shop website one could add comparisons of various factory shop prices, pictures of factory shops and lists or pictures of merchandise available per shop. In addition to this the website administrator could update the goods field by phoning each factory shop and requesting them to name each type of merchandise they sell. The user could then become more specific in their searches and search for "reuse bags" instead of "plastic" articles.

One could even add the possibility of online shopping where the users can buy directly from the factory shop over the Internet. All these additions will require a dedicated website administrator to update the site weekly or, in the case of merchandise lists, possibly even daily.

This study could be used as a guideline in the creation of any number of tourism sites. These websites might market tourism goods or attractions within a city or country. The use of interactive maps on the Internet is in its infancy in South Africa and has the potential to revolutionise the tourism industry and to empower tourists. As Sweeney (2000) avers, Internet marketing seems a natural choice for tourism.

[Word count: 16 766]

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APPENDIX A: TOURISM WEBSITES AND ONLINE MAPS

Table A1 lists tourism website addresses and comments on the content of each website with respect to tourism maps.

Table A.1 Tourism website addresses and contents

Website address	Content
www.sawelcome.com	Official gateway to South Africa. Contains various links to tourist information.
www.travel.co.za	Allows the tourist to do everything from booking accommodation to viewing maps of various areas or tourism Internet links to those areas.
www.capetown.org	Cape Town's official tourism website, lists shops and contains a link to leisure maps (see website description below).

(Continued on next page)

Table A.1 continued.

www.gocapetown.co.za	Lists tourist attractions with telephone numbers. Contains a map showing the municipal areas within the CMA.
www.southafrica-travel.net/westcape/cato_01.htm	General tourist information about Cape Town.
www.worldexecutive.com/cityguides/cape_town/maps.html	Contains static maps of restaurants and hotels.
www.leisuremap.co.za/hatscript/hsrun.exe/webapps/guide/HAHTpage/HS_MapPage	Contains dynamic maps of Cape Town with basic queries to locate suburbs, etc.
www.cape-town.net/html/mapcity.html	Contains a static map of Cape Town.
www.capetown.co.za	Contains general tourist information, including activities to do.
www.helderberg.com	Contains information about the Helderberg area and a static locational map.

Figures A.1 to A.7 are a sample of maps available on the Internet. The website address for each map is listed below the map.

Search Results

From: Redlands, California, United States
To: Boston, Massachusetts, United States

[Print this route](#) [Save this route](#) [E-mail this route](#)



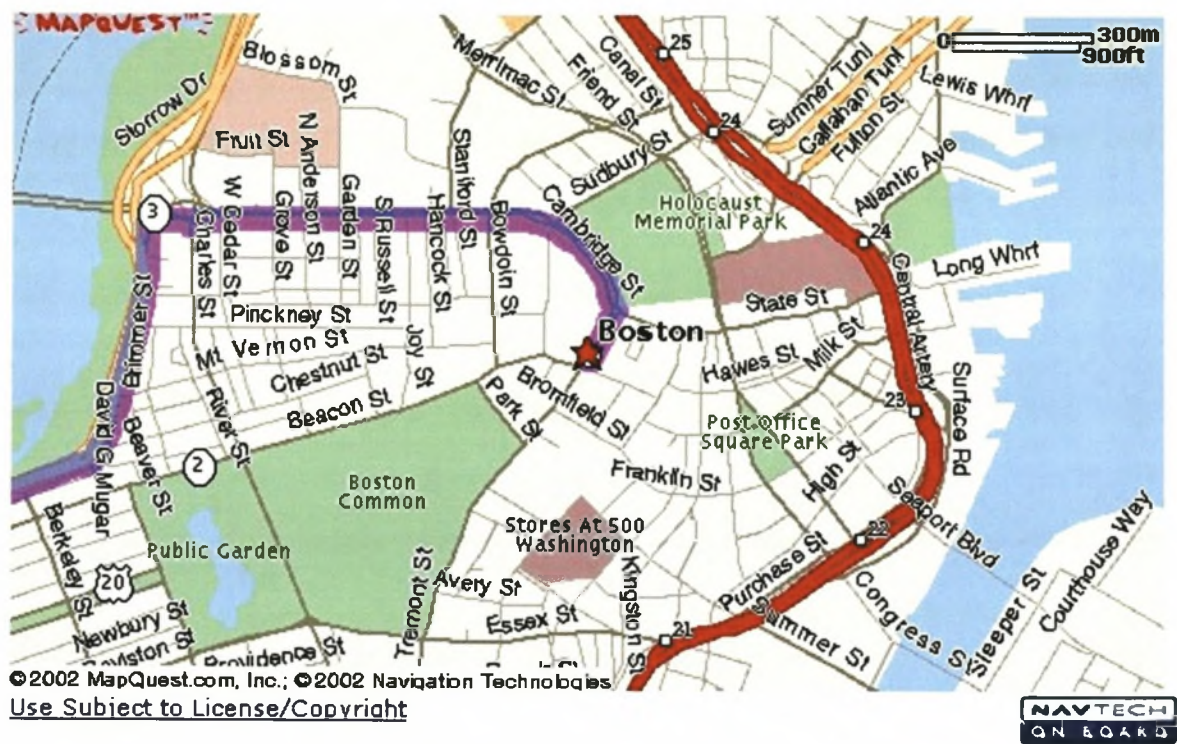
Directions	Distance	Time
Start: Depart Redlands, California, United States on Ramp (West)	0.3	0:01
1: Merge onto I-10 [San Bernardino Fwy] (West)	10.9	0:07
2: Turn off onto Ramp	1.4	0:02
3: Merge onto I-215 [Riverside Fwy] (North)	20.9	0:14
4: Continue (North) on I-15 [Barstow Fwy]	736	7:02

Source: www.expedia.msn.com

Figure A.1: Expedia interactive map

YOU ARE HERE:
[Road Trip Planner](#) > [Your Route](#) > Segment # 1: Destination Map

Boston, MA



Source: www.mapquest.com

Figure A.2: MapQuest interactive map



Source: www.go2africa.com

Figure A.3: Go 2 Africa static map

www.gocapetown.co.za

CAPE METROPOLITAN TOURISM

About Cape Town

Area Map

Conference City

Tourism Routes

Planning a Trip

Links

Search

Special Events

Online News

Media Resources

Send a Card

Contact Us

Tourism is everyone's business



Nestling between the blue waters of the Atlantic and warmer surf, the Cape Metropolitan Area, a place filled with natural beauty at the tip of South Africa, has now become a top tourist destination.

Cape Town Time - 9:19:12 AM



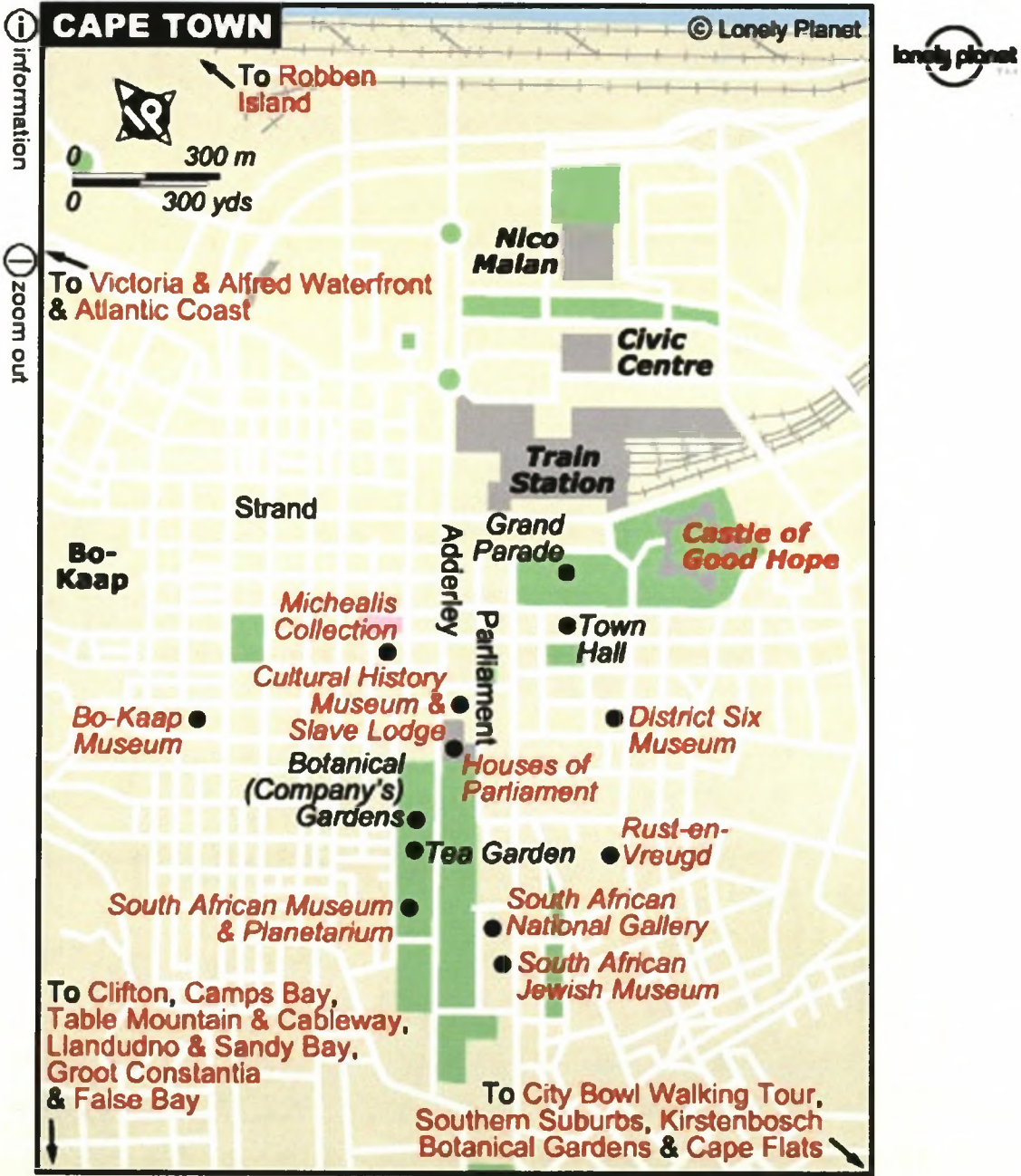
New Millennium Metered Taxi Fleet for Cape Town

Whether you're a discerning businessman, pleasure-loving bohemian, thrill seeking adventurer, sports fanatic or inquisitive historian, the Cape Metropolitan Area offers you a rich variety of activities to excite the senses. Enjoy classical music with the Philharmonic Orchestra and sunset concerts at Kirstenbosch Botanical Gardens.

Buskers entertain you as you explore the city malls, and down at the V&A Waterfront there's live music at the open air amphitheatre.

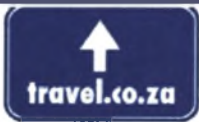
Source: www.gocapetown.com

Figure A.4: City of Cape Town's official website




Source: www.lonelyplanet.com

Figure A.5: Lonely Planet static map



For people
who know
where they're going



for people
who know

SEARCH RESULTS FOR Place : Access City (Factory Shops)



Powered by


Source: www.travel.co.za

Figure A.6: MSN Travel interactive map

[Cape Town
Weather](#)

**World
Executive**

[Cape Town
Guide
Home Page](#)

[Hotel Discounts
in Other Cities](#)

[Worldwide
Hotel Search](#)

Cape Town Area Map



16 kilometres (10 miles)

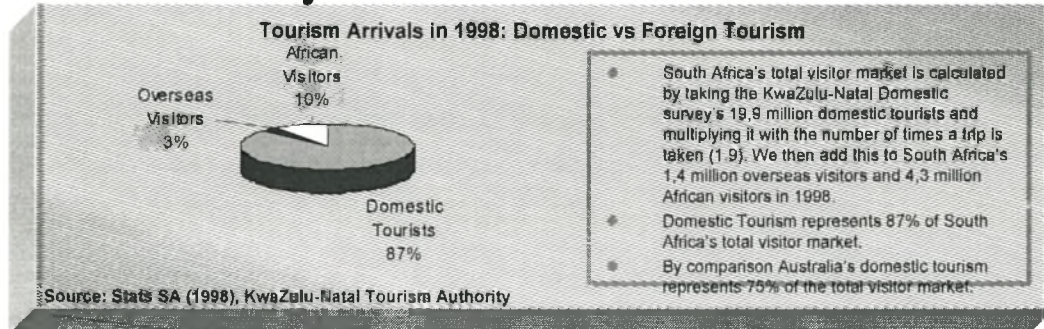
- [Blues](#)
- [Buitenverwachting](#)
- [Kirstenbosch National Botanical Gardens](#)
- [The Cellars](#)
- [The Bay Hotel](#)
- [Rhodes Memorial](#)
- [Place on the Bay](#)
- [Africa Cafe](#)
- [Alphen Hotel](#)

Source: www.worldexecutive.com/cityguides/cape_town/maps.html

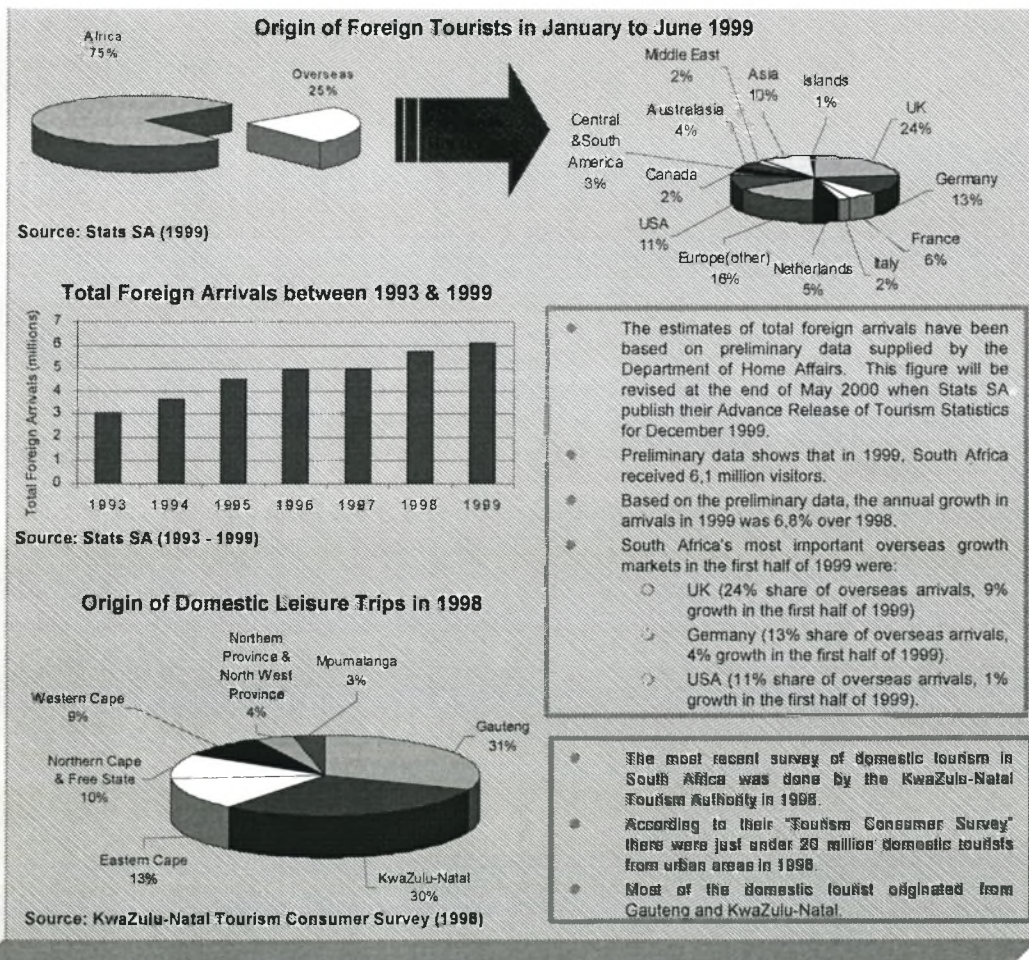
Figure A.7: World Executive static map

APPENDIX B: TOURISM FACTS AND FIGURES

Size of the Industry:



Origin of Tourists:

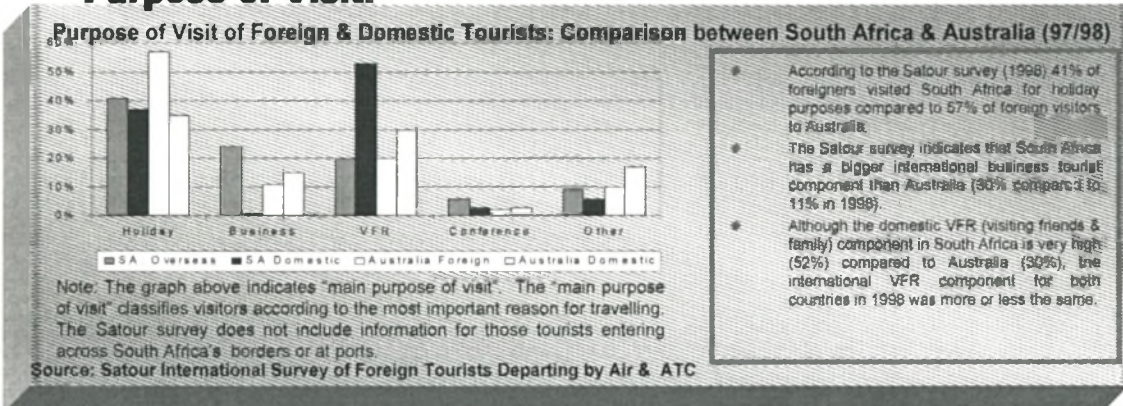


Source: www.satour.co.uk

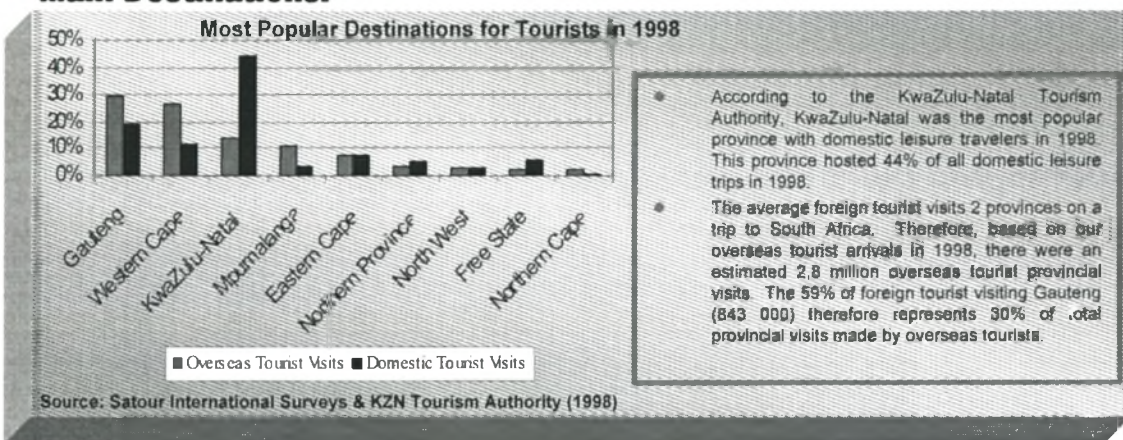
Figure B.1: The South African Tourism fact sheet

Figure B.1 (Continued)

Purpose of Visit:



Main Destinations:



Length of Stay:

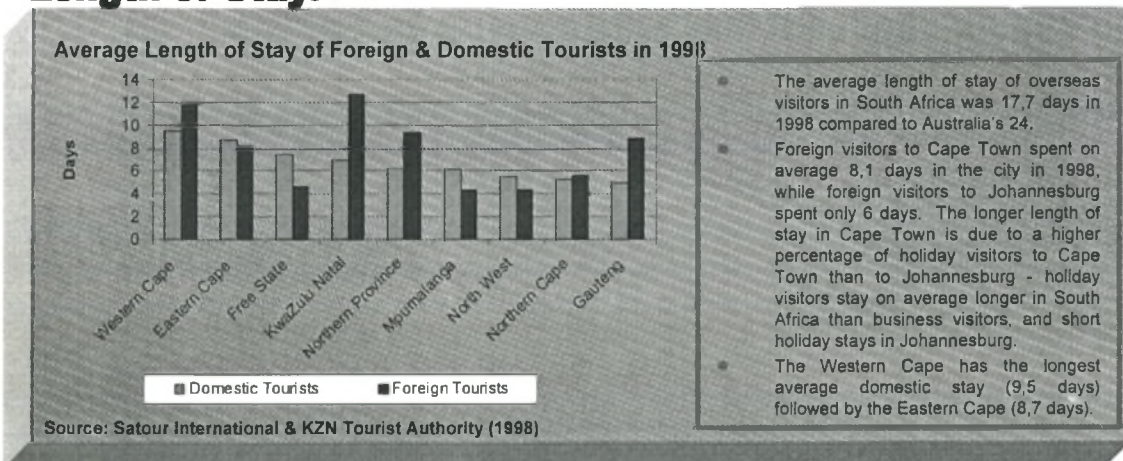
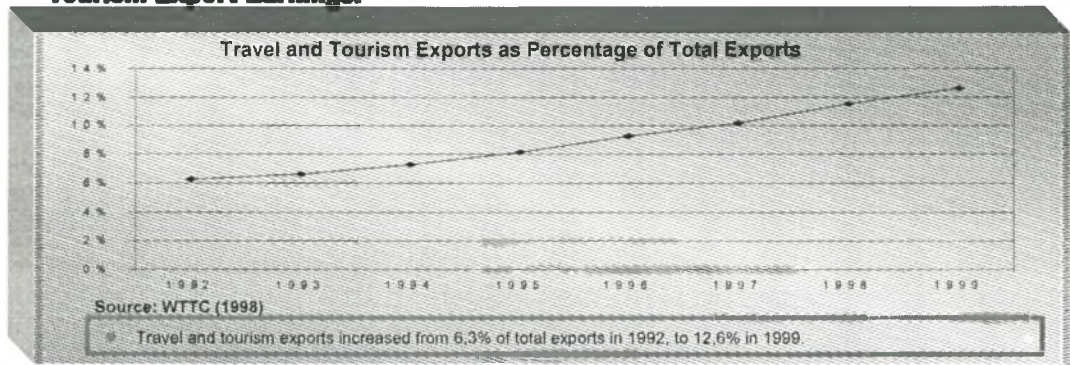
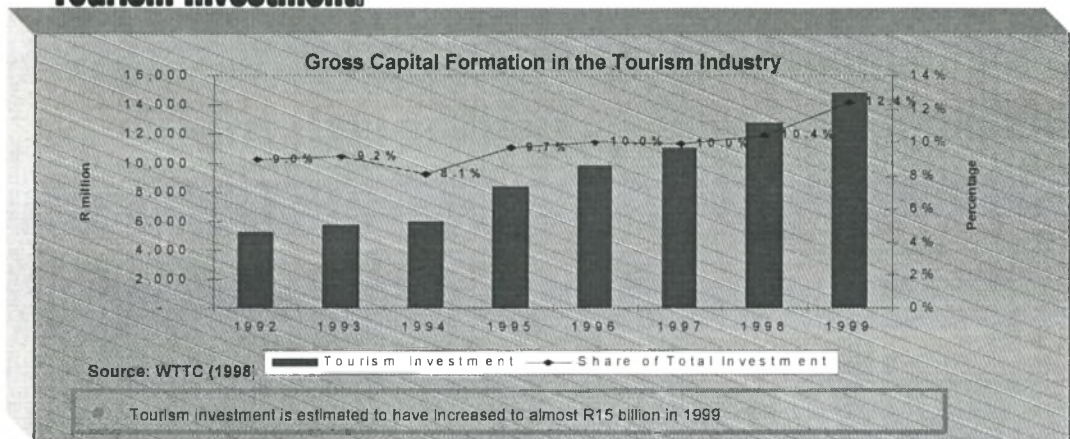


Figure B.1 (Continued)

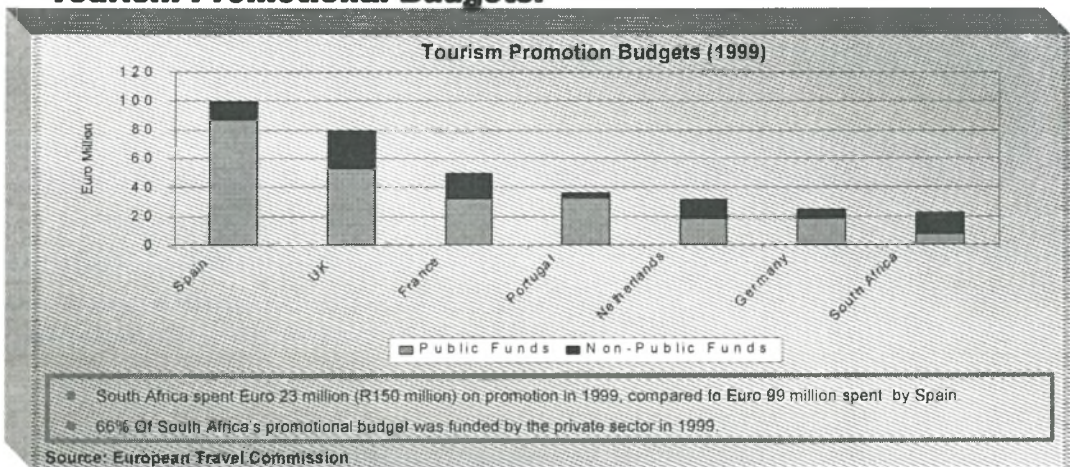
Tourism Export Earnings:



Tourism Investment:



Tourism Promotional Budgets:




APPENDIX C: FACTORY SHOP ADVERTISEMENTS

BELLVILLE
35 NORTHUMBERLAND Ave - Tel: 949 6598

Only underwear

ACCESS PARK - tel 683 6837 CANAL WALK - tel 555 3058 ACCESS CITY - tel 903 6257

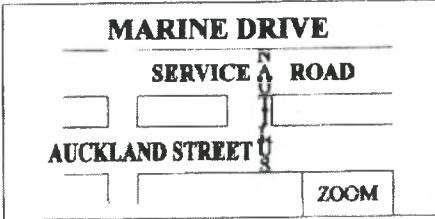
THE PLASTICS WAREHOUSE



ZOOM

FACTORY OUTLET

TRADING HOURS :
Monday - Thursday 9am - 4:30pm
Friday 9am - 3pm
Saturday 9am - 1pm

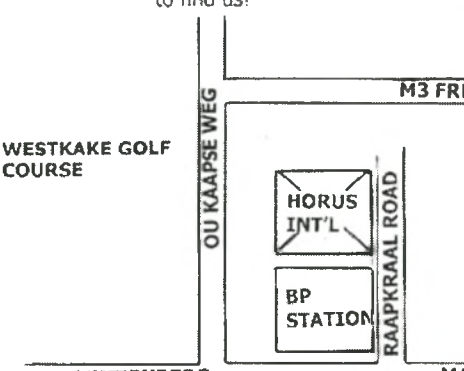


VISA OR MASTER CARD AND CASH ONLY

18 ISLAND PARK, AUCKLAND STREET, PAARDEN EILAND
TEL : 510 4707 FAX : 510 4718

YOUR SPECIALIST SOURCE OF OVER 1500 PLASTIC PRODUCTS THAT FIND A PRACTICAL USE IN ...THE HOME, BUSINESS, EDUCATION & INDUSTRY.

HORUS INTERNATIONAL (FACTORY SHOP) – stockists of a wide range of functional household products, accessories & gifts. See map below on how to find us!



Trading Hours:
Mon/Thurs 9.00am / 4.00pm
Friday : 9.00am / 2.00pm

Intimate Value

(Ex Gossard Factory Shops)

Quality - Fashion - Value

Ladies Lingerie

Also: Ladies Hosiery
Mens Underwear

We sell Quality Fashion Brands
@ between 50% and 70% of Retail !

Goodwood - N1 Value Centre: Shop 67 tel: 595 1759

Source: KFM Factory Shop Show, Bellville Veladrome, 7 December 2002

Figure C.1: Montage of flyers for factory shops collected at the Factory Shop Show